CHNOLOGY DEPT.

DECEMBER 1951

The Paper Industry

PUBLIC LIBRARY
DEC 29 1951
DETROIT

OTARY UNIONS

(Trade Name)

ep Pace with Industry Demands

ype "FSG" ROTARY UNION especially designed for con- us heavy duty service on s. This unit is flanged di- y to the journal and revolves the drum itself.

Type "FSG" ROTARY UNION
(Flange syphon type with all graphite bearing construction)

Specialists in Steam Joints for Over 18 years!

Replace your worn out Steam Joints with ROTARY UNIONS

"Where Good Connections Count"

Low Friction

This unit employs a special heavy-duty, low-friction, metal-backed graphite bearing which requires no lubrication. This outstanding feature enables the Type "FSG" ROTARY UNION to be used for continuous service on high pressure and high temperature applications.

Syphon Support

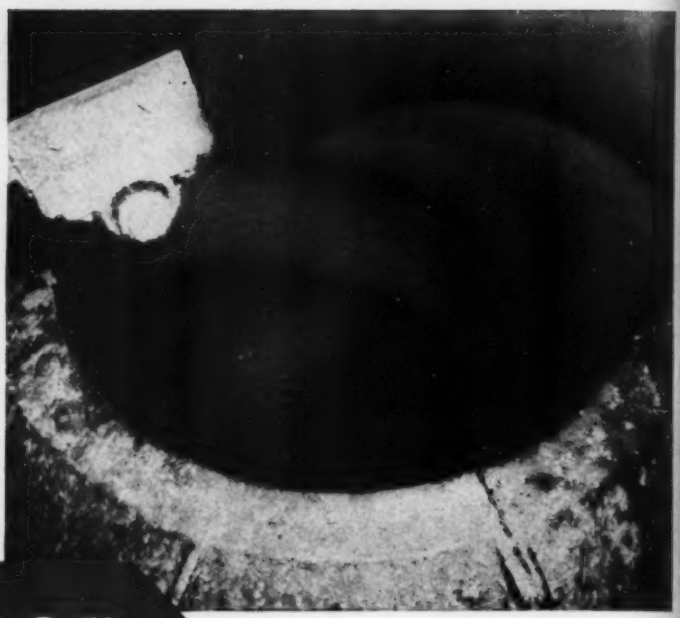
The Type "FSG" ROTARY UNION has a two-point syphon support affording better alignment of the syphon pipe, preventing wearing-through and falling-off of syphon pipes, at the same time eliminating excessive strain on syphon pipe threads.

Guaranteed

As a result of many years of study and experimental research, together with field tests, we can guarantee the Type "FSG" ROTARY UNION to give satisfactory performance at low overall operating costs.

PERFECTING SERVICE CO., 332 Atando Ave., Charlotte, N. C.
Offices in Chicago • Cleveland • Philadelphia • Providence • Jersey City

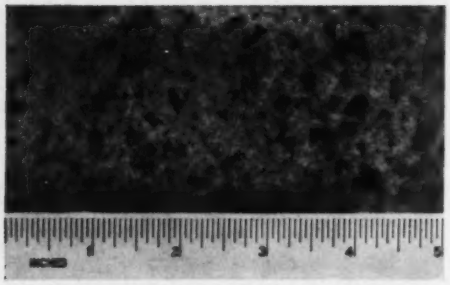
Less Horsepower per ton of pulp production



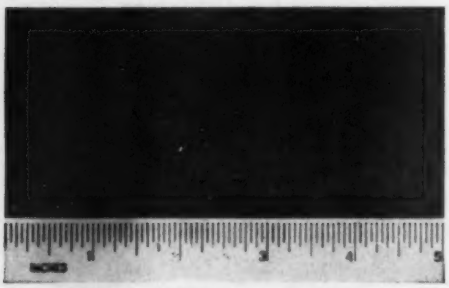
the Downingtown

Fibrepulper

utilizes power more efficiently . . . !



High wet strength government map paper after 30 minutes pulping in water 200°F. in Downingtown Fibrepulper.



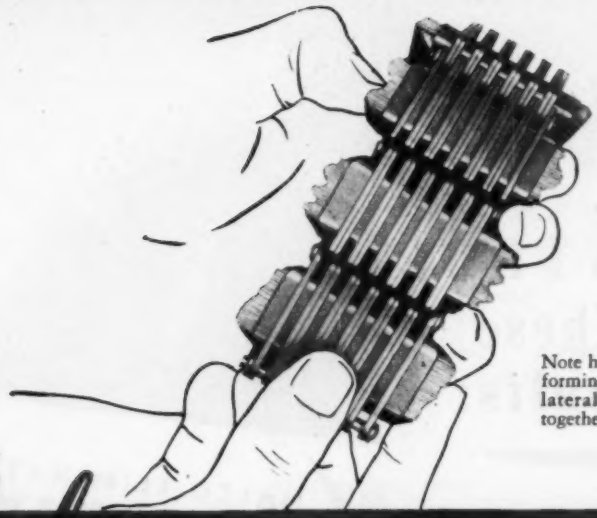
Same paper after 90 minutes of pulping.

Because of its shape and design, the Downingtown Fibrepulper increases the number of times the pulp is passed through the defibring area within a given interval of time. This results in a more thoroughly refined pulp and a consequent appreciable decrease in kilowatt hours required per ton of output. With the high pulping rate the size of the unit is smaller for a given tonnage output. This reduction in size results in space saving and installation cost.

Installations of the Downingtown Fibrepulper are helping mills conserve power, increase production and reduce costs. Our technical men are available to discuss pulping problems with you by appointment.

DOWNINGTOWN MANUFACTURING CO., DOWNINGTOWN, PA.
Pacific Coast Representative: John V. Roslund, Pacific Bldg., Portland 4, Oregon
IN CANADA: *WATEROUS, Limited, Brantford, Ontario*

DOWNINGTOWN



Note how slats in the self-tooth-forming chain are free to move laterally — either singly or together.

Only **the P.I.V. variable speed drive uses**

SELF-TOOTH-FORMING CHAIN

to give you positive, stepless speed changing

The operation of Link-Belt's P.I.V. Variable Speed Drive is not dependent upon friction for power transmission.

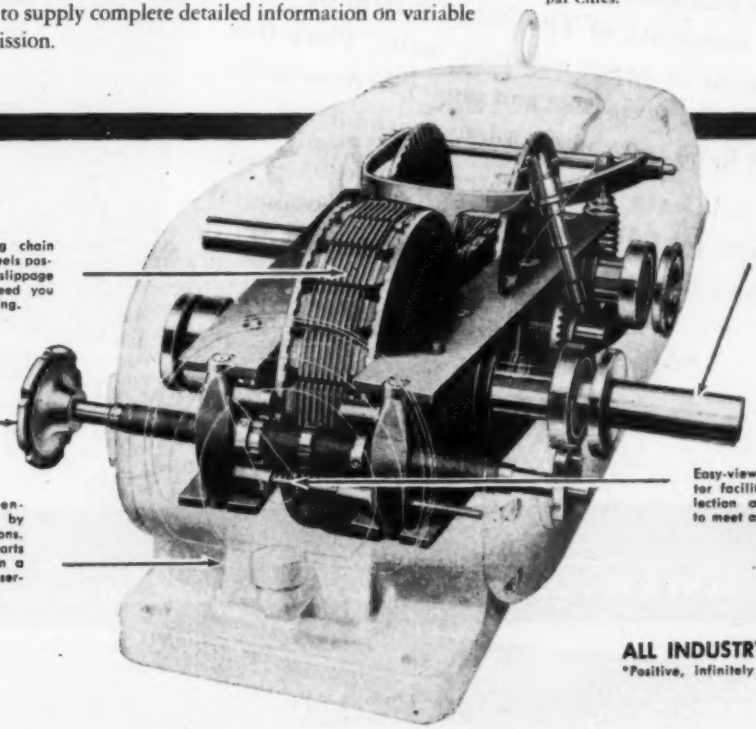
That's because only Link-Belt's P.I.V. has the self-tooth-forming chain that allows *positive*, stepless speed adjustment.

If you've been looking for exact speed changing that will deliver full rated horsepower to your machines, it will pay you to call your nearest Link-Belt branch office, as our representatives are equipped to supply complete detailed information on variable speed transmission.

LINK-BELT P.I.V. VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.

12.272



Self-tooth-forming chain grips toothed wheels positively without slippage — gives the speed you need at any setting.

You can get minute speed changes and maintain them accurately while operating under full load.

An infinite number of positive, stepless speed adjustments may be made with manual, electric, pneumatic or hydraulic controls.

Easy-view speed indicator facilitates speed selection and adjustments to meet all requirements.

All-metal, totally enclosed — unaffected by atmospheric conditions. All vital operating parts splash-lubricated from a common housing reservoir.

ALL INDUSTRY USES P.I.V.*

*Positive, infinitely variable

Nalco

PITCH CONTROL Produces These Typical Results:

✓ "PAPER MACHINES IN FINE CONDITION"

From a Nalco Engineer's report on The Nalco System of Pitch Control in a mill producing fine papers:

"Beater Room Superintendent reported that paper machines were in very fine condition when examined during shutdown period over the weekend. Trays were reported in very good condition and much better than formerly noted. No sticking on press rolls. Oliver filter reported in good condition, no plugging. The Savalla Saveall reported in very good condition."

✓ NALCO ELIMINATED PITCH AND POPLAR WAX

In a mill manufacturing semi-chemical pulp, another Nalco Engineer reports:

"This company ran into considerable trouble recently from pitch and poplar wax in their semi-chemical corrugated medium. These waxes caused filling of wires and sticking of press rolls which in turn caused up to 30 breaks in a day. Nalco Pitch Control was applied at the fan pump and eliminated their trouble."

THE examples above are typical of the success and versatility of The Nalco System of Pitch Control in paper and pulp mills. Pitch-free operation saves time and money in these mills, and helps to produce a better product.

If you have pitch control problems, write Nalco for full data on the efficient, economical Nalco System as it may apply to your mill.

Nalco
BALL
FEEDER
Nalco Ball Feeders utilize Nalco Ball Briquet chemicals weighing one pound each to provide simple, virtually foolproof control of feeding. Where mills have facilities for pulverized or liquid feeding of chemicals Nalco can also provide them.

NATIONAL ALUMINATE CORPORATION
6232 W. 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario, Canada

THE
SYSTEM • Serving the Paper Industry through Practical Applied Science

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 33 • NUMBER 9 • DECEMBER, 1951

Features . . .

Mill expansion plans 1025

Accident-free record at U.S. Gypsum's Oakmont plant 1048

Align shafts, not couplings 1050
by J. E. Petermann and W. F. King

Paper and paperboard making—XX 1051
by Harry Williamson

Comparison and selection of fuels 1053
by David Moffat Myers

Flambeau improvement program 1054

Safety in caustic and recovery operations 1055
by Fred O. Soughton and Gordon Rowlandson

Automatic control of paper tension 1057
by G. C. Eheman, Jr., R. C. Berger and W. Mikelson

Cellophane industry in the West 1059
by William C. McIndoe

Chesapeake expands to 500 tons 1062
by Richard W. Porter

News . . .

News of the Industry 1023

Association News 1073

Names in the News 1085

Necrology 1090

Departments . . .

Editorial 1015

Current Comment 1017

Financial reports 1017

Pictured Highlights 1047

Paper Sketches 1070

Coming Events 1082

Foreign Abstracts 1094

New Products 1098

New Literature 1102

Current Market Quotations 1106

Index to Advertisers 1108

THE PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index**. An index to each volume is issued annually by the publisher as a part of the April number.

Copyright 1951 by Fritz Publications, Inc.

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

Publication Staff:

President and General Manager
A. SCOTT DOWD

Vice President and Treasurer
A. C. L. FRITZ

Secretary
A. C. BRUCE

Editorial Director
RICHARD W. PORTER

Production Manager
EDGAR C. FARREN

Circulation Manager
STANLEY E. BOIE

Circulation Field Representative
C. J. ELWELL

Advertising Representatives:

CHICAGO 5: **John D. Henderson,** 431 South Dearborn Street, Wabash 2-3543.

NEW YORK 20: **L. S. van Nydeck,** 9 Rockefeller Plaza, Circle 7-3085.

NEW YORK 25: **H. A. Johnston,** 945 West End Avenue, Academy 2-6984.

BOSTON 16: **Meade & Company,** 471 Statler Building, Liberty 2-9677.

CLEVELAND: **L. M. Perkins,** 1199 Dorsh Road, South Euclid 21, Ohio, Evergreen 1-3232.

LOS ANGELES 14: **Murray Bothwell,** 412 West Sixth Street, Vandike 5875.

PORTLAND: **Murray Bothwell,** 412 West Sixth Street, Los Angeles 14, Calif., Vandike 5875.

SEATTLE 4: **Arthur G. Neitz,** 914 Second Avenue, Eliot 1769.

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

Published at 404 North Wesley Avenue, Mount Morris, Illinois.

Address all correspondence intended for publication to Editorial and Executive Office, 431 South Dearborn Street, Chicago 5, Illinois.

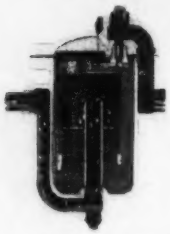
Member: Audit Bureau of Circulations, The Associated Business Publications.

Entered as second class matter December 13, 1948, at the post office at Mount Morris, Illinois, under the Act of March 3, 1879.

Subscription rates: United States, U. S. Possessions, and Canada, $3.00 for one year, $5.00 for two years, $6.00 for three years. All other countries, $8.00 for one year, $18.00 for three years, payable in advance in U. S. Funds.

ARMSTRONG PRODUCTS FOR BETTER PAPER MILL PERFORMANCE

SPECIAL TRAPS FOR DRYER DRAINAGE



Better Performance,

Low First Cost,

Low Maintenance.

USE of an individual Armstrong trap on each paper machine dryer insures quick removal of condensate, air and incondensible gases at any pressure, provides higher operating temperatures. The cost is far less than for more elaborate systems and the special new Armstrong paper machine trap gives you long life with low maintenance. Quality is guaranteed.

BULLETIN NO. 205 ➧

. . . explains why you can depend on Armstrong paper machine trap performance. Send for a copy.

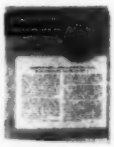
INDIVIDUAL DRYER TEMPERATURE CONTROL FOR PAPER MACHINES

Automatically maintains dryer temperature at any point from 100°F to 250°F

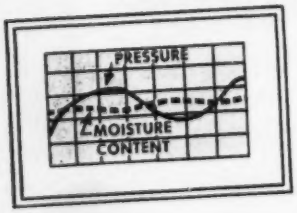
THIS control mixes air with steam to maintain relatively cool wet end dryers. This prevents the sheet from sticking to the dryer surface and avoids curl or cockle due to overdrying on one side. The rest of the machine operates at maximum temperature.

BULLETIN NO. 187 ➧

. . . explains the Control and its advantages. Write for a free copy.



MOISTURE CONTROL SYSTEM FOR PAPER MACHINES



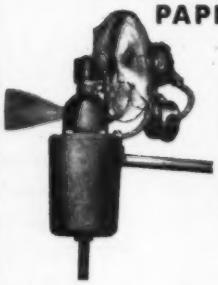
Automatically maintains very uniform sheet moisture content at any desired percent

THIS control maintains much more accurate sheet moisture content than is possible with hand control or constant steam pressure. It detects moisture content changes as the sheet passes over an "indicating dryer" and then varies steam pressure on the entire machine to compensate for the moisture variation.

BULLETIN NO. 196 ➧

. . . tells how the Moisture Control works, explains the specially designed components, lists the advantages. Send for your copy.

STEAM HUMIDIFIERS FOR PAPER STORAGE



Automatically adds moisture to maintain any desired relative humidity

ARMSTRONG Steam Humidifiers prevent the headaches caused by moisture loss from paper in storage; eliminate printing and converting problems. They connect into existing steam systems in much the same way as unit heaters, are economical, accurate, quiet, dripless. A size and type for every requirement.

BULLETIN NO. 1772 ➧

. . . discusses relative humidity, gives data and prices on Armstrong Humidifiers, explains hookups, selection, etc. Send for your copy.

ARMSTRONG MACHINE WORKS

816 Hoffman Street • Three Rivers, Michigan

High Yield High Quality!

The extra 20% you get from your wood with the Sutherland High Yield Sulphate System is vitally important from the standpoint of economy and conservation. But just as important is the fact that you can get this increase in yield and still maintain high quality. Without exception, the mills using Sutherland Systems have found that high yield pulps are just as good as their low yield pulps ever were and, in many cases, are definitely superior.

We'd like to tell you how you can get *quality* pulp in your mill at lower cost. Our advice is yours for the asking —write or wire us today.

SUTHERLAND

continuous beating systems

Designed, Engineered, Serviced

by SUTHERLAND REFINER CORPORATION

TRENTON 8, N. J.

ARBOR DAY was started in Nebraska 79 years ago by J. Sterling Morton to stimulate interest in tree planting. Since 1941, through its Tree Farms, the Weyerhaeuser Timber Company has made a large-scale practical business of reforestation.

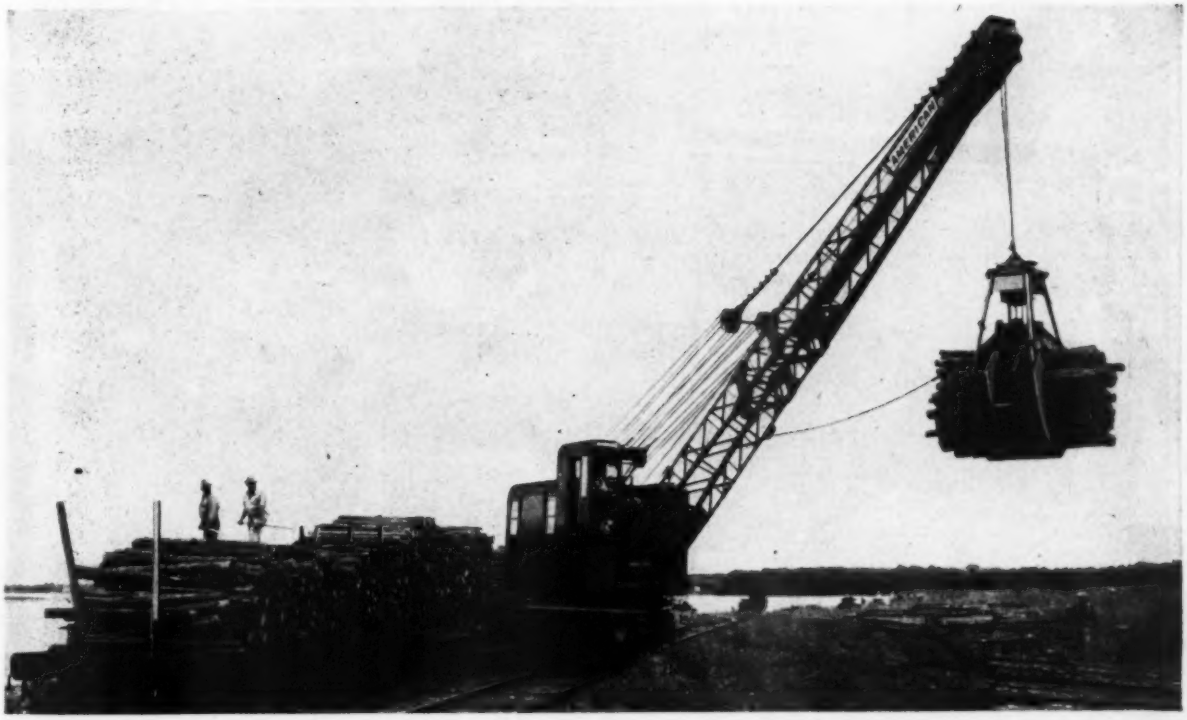
Most Weyerhaeuser Tree Farms are located west of the Cascade Mountains, which is Douglas Fir country. In these forests, nature, with man's help, reseeds the harvested lands. Thousands of seeds are carried from the ripened cones of mature trees which are left standing in groups, strips or blocks by Weyerhaeuser loggers. This system of harvesting is called *block logging*, and leaves a patchwork pattern of cut and uncut areas.

Where seed trees and seedlings have been destroyed by forest fires, Weyerhaeuser Foresters must plant seedling trees. This is slow, hard and costly work, and fortunately less than 3% of Weyerhaeuser Tree Farm lands require hand planting.

As mature timber is logged in the forests under Weyerhaeuser management, the harvested land begins growing new trees. Thus, Weyerhaeuser Tree Farm lands will continue to produce successive timber crops.

WEYERHAEUSER

Saves 79% on fuel



IF YOU are still paying "extortion" money to over-age steam cranes, you will be interested in the matter of fuel costs . . . just one item of operating expense. For one crane owner, the fuel bill was cut from $6.60 a day to about $1.40 a day by replacement of a steam crane with a modern American Locomotive Crane.

In addition to this 79% saving, higher speed enabled the new machine to handle a much larger tonnage on the job. And three stops each day for coal and water were completely eliminated.

What saving can *you* expect? That depends on the job, and the type of American Locomotive Crane you select. Why not mail the coupon below, and then let us discuss your operations specifically.

Modernize...economize...with

American Hoist & Derrick Company

ST. PAUL 1, MINNESOTA

42

American Hoist & Derrick Co. 1608

St. Paul 1, Minnesota

● Please send literature on

AMERICAN LOCOMOTIVE CRANES

Capacity_____tons ☐ Diesel ☐ DiesELectric

Name_____

Company_____

Address_____

City_____ State_____

Clearer Water....

obtained in **LESS SPACE** *and at* **LOWER COST** *with this* **GRAVER REACTIVATOR**

The accompanying photograph shows a Graver Reactivator installed alongside a conventional rectangular treating tank for a West Coast water supply.

The two units have the same capacity—but notice the far smaller size of the circular GRAVER unit.

And this saving in space is only one of the GRAVER advantages. With initial raw water turbidity varying between 50 and 200 ppm, the smaller GRAVER unit produces an effluent with only 4.5 ppm turbidity . . . less than half that of the effluent from the larger conventional unit, and with no greater cost of chemicals.

The Engineer operating this equipment writes: *"You are to be congratulated on having a piece of equipment that really lives up to expectations."*

To be sure of dependable results in treating your water supply, such as those obtained at this plant, investigate GRAVER Reactivators. Write for complete information. GRAVER recommendations are based on 40 years of specialized experience in solving Water Treatment problems.

GRAVER WATER CONDITIONING CO.
Division of Graver Tank & Mfg. Co., Inc.
216 WEST 14th STREET, NEW YORK 11, N. Y.

GRAVER

SW 4088

For tubing satisfaction...

Are your condenser, evaporator, and heat-exchanger tubes of the best available analyses to meet the stepped-up conditions of current operation? For example, in handling sulfate pulping liquors, there is little or no difference in the service life of various stainless steels. However, in handling sulfite liquors, the use of stainless tubing of higher chromium content, including those containing molybdenum, give sufficiently increased service life to warrant, in most cases, their additional cost. If you aren't absolutely sure about your tubing requirements ask Mr. Tubes — your B&W Tube Co. representative — to step into your next retubing problem. He can advise on the seamless or welded tube best suited to give you an optimum cost-life ratio from the following B&W analyses:

Carbon Steel	Croloy 18-12 (Type 305)
*Nicloy 3½ (3¼-3¾% Nickel)	Croloy 16-13-3 (Type 316)
*Nicloy 5 (4¾-5¼% Nickel)	Croloy 18-13-3 (Type 317)
Croloy 18-8-5 (Type 304)	Croloy 18 (Type 430)

*Available seamless only.

In addition to the grades listed above, B&W makes seamless and welded tubing in a wide range of other stainless and alloy steel grades. Send for new bulletin TB-328.

THE BABCOCK & WILCOX TUBE COMPANY

Executive Offices: Beaver Falls, Pa.

General Offices & Plants

Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

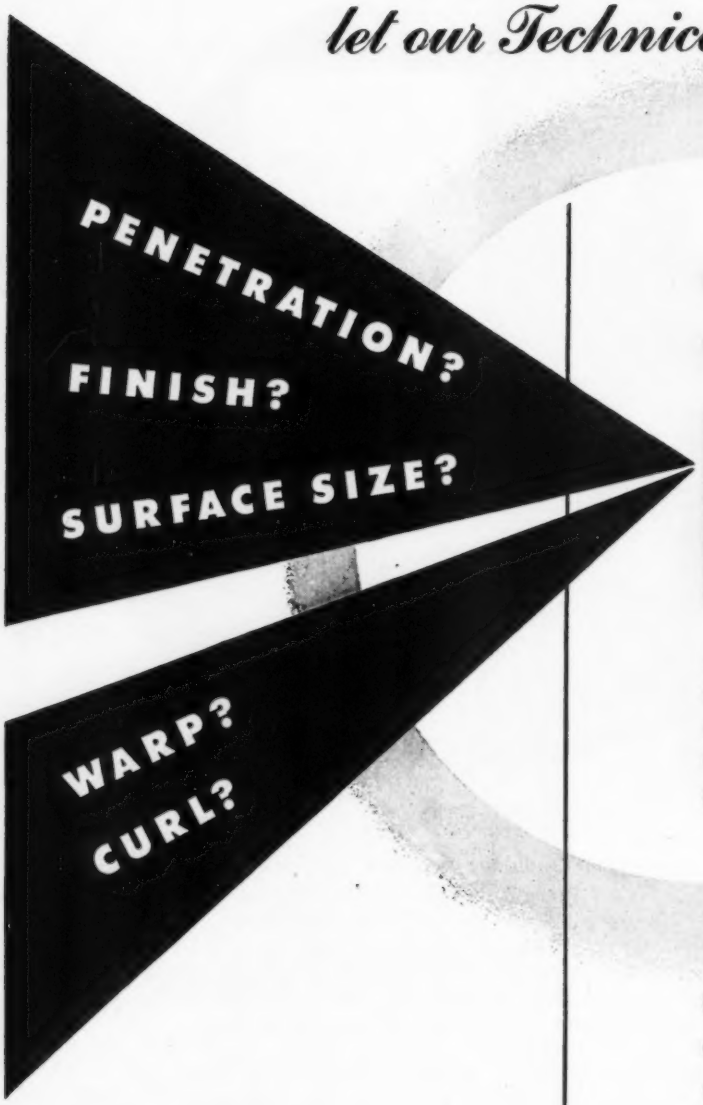
Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. • Cleveland 14, Ohio • Denver, Colo. Detroit 26, Mich. • Houston 2, Texas • Los Angeles 15, Calif. • New York 16, N. Y. • Philadelphia 2, Pa. St. Louis 1, Mo. • San Francisco 3, Calif. • Syracuse 2, N. Y. • Toronto, Ontario • Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

TA-1627-5

paper or paperboard **PROBLEMS?**

let our Technical Dept. help you



CORRECT WITH

kelsize

A Hydrophilic Colloid that effectively regulates surface density and penetration.

For detailed information in terms of your particular problem, write or call our nearest regional office.

KELCO
REFINED ALGIN PRODUCTS

...A PRODUCT OF KELCO COMPANY

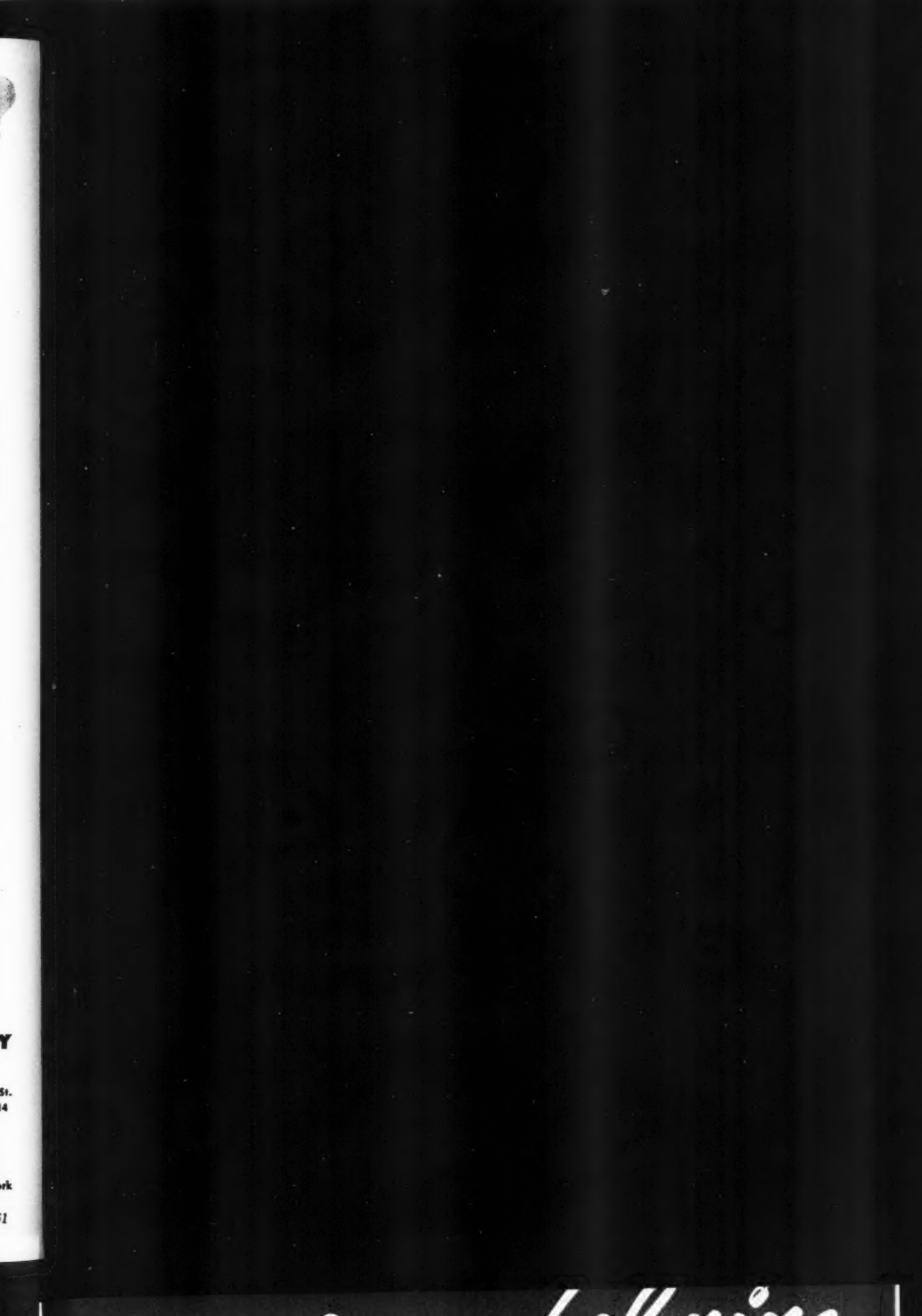
kelsize

20 N. Wacker Drive
Chicago 6

31 Nassau St.
New York 5

530 W. Sixth St.
Los Angeles 14

Cable Address—Kelcoalgin—New York



An Overwhelming Preference

for DIAMOND Automatic Cleaning OF CHEMICAL RECOVERY BOILERS

Diamond Automatic Soot Blowers have been sold for the cleaning of chemical recovery boilers in the following plants. This list covers all but three or four of the black liquor jobs placed in the United States and Canada in recent years. The reason for this overwhelming preference? You obtain correct recovery boiler cleaning and high boiler availability at minimum cost by using Diamond Automatic Soot Blowers.

Bandel, Steward & Welch, Ltd.
Brompton Pulp & Paper Co.
Brown Company
Brown Paper Mill Company
Brunswick Pulp & Paper Co.
Calcasieu Paper Company
Camp Manufacturing Company
Canada Paper Company
Cellulosa Kaucera (Sweden)
Champion Paper & Fibre Co. (2 Plants)
Chesapeake Corporation
Companhia Portuguesa de Celulose (Portugal)
Consolidated Paper Company
Container Corporation of America
Continental Can Company
Crossett Paper Mills Ltd.
Crown Willamette Paper Co.
Dryden Paper Company
Enso-Gutzeit Oy (Finland) (2 Plants)
Fibre Board Products Corp.
Fraser Company, Ltd.
Gaylord Container Corp.
Gulf States Paper Company
Halifax Paper Company
Hollingsworth & Whitney Co.
Hudson Pulp & Paper Co.
International Paper Corp. Southern Kraft Division (7 Plants)
Kalamazoo Vegetable Parchment Co.
Longlac Pulp & Paper Co.
Longview Fibre Co.
H. R. MacMillan Export Corp. Ramsinn Sulphate Pulp Div.
Maren Kraft Company
Marathon Paper Company
Mead Corporation (2 Plants)
Mo and Domsjo A. B. Hemmes (Sweden)
National Container Corp. (3 Plants)
National Paper Corp.
North Carolina Pulp Co.
Oxford Paper Company
Pacific Mills Limited
Rauma-Repola Oy (Finland)
Riegel Carolina Corp.
St. Helen's Pulp & Paper Co.
St. Joe Paper Company
St. John's Sulphite, Ltd.
St. Mary's Kraft Corp.
St. Regis Kraft Corp.
St. Regis Paper Co. (2 Plants)
Howard Smith Paper Mills, Ltd.
Sorge Pulp Co., Ltd.
Southern Advance Bag & Paper Co
Southern Paperboard Co.
Tillamook Pulp & Paper Co.
Union Bag & Paper Co.
Union Corporation, Ltd. (S. Africa)
United Paper Company (Finland)
S. D. Warren Co.
West Virginia Pulp & Paper Co. (2 Plants)
Weyerhaeuser Timber Co. (3 Plants)

Only DIAMOND Offers You All This Application Experience

DIAMOND POWER SPECIALTY CORP.
LANCASTER, OHIO
Diamond Specialty Limited - Windsor, Ontario

There is a DIAMOND SOOT BLOWER for Every Boiler Cleaning Requirement

HAM FELTZ says:

A perfect fit

don't need alterations!

Some wet felts run two or three inches over the end of the roll. They have to be tore down like the legs of ready-made pants. That's poor economy.

When you order felts you better do like you do when you order pants. Call for them by the name of the maker and look for the trade mark. If they are Hamilton Felts there won't be any need for alterations.

From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at a lower cost.

Hamilton Felts

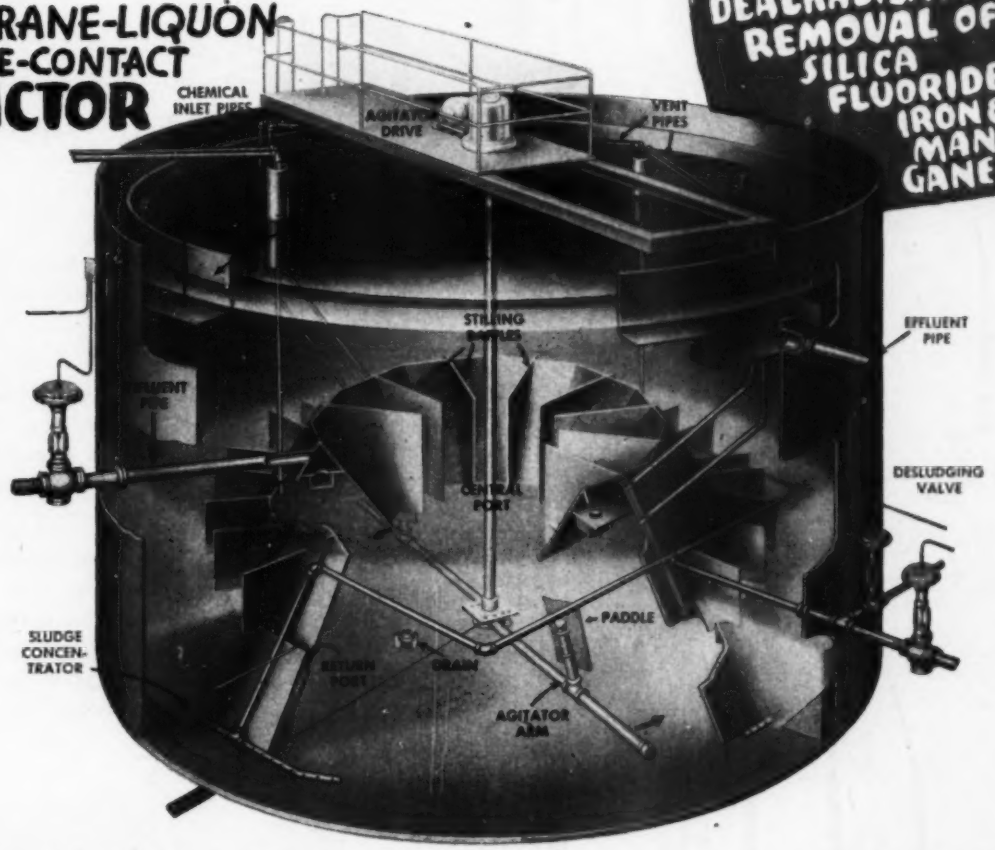
MIAMI WOOLEN MILLS

Established 1858

SHULER & BENNINGHOFEN, HAMILTON, OHIO

Maximum CLARIFICATION with the COCHRANE-LIQUON SLUDGE-CONTACT REACTOR

WATER SOFTENING
DEALKALIZATION
REMOVAL OF
SILICA
FLUORIDES
IRON & MANGANESE



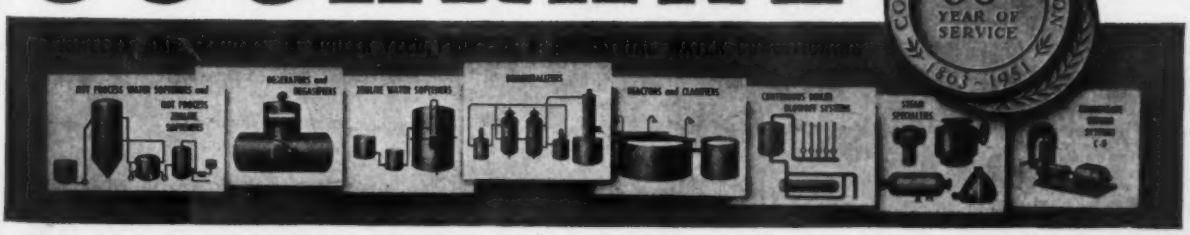
EMBODIES ALL 8 BASIC DESIGN REQUIREMENTS of the Sludge Contact Process

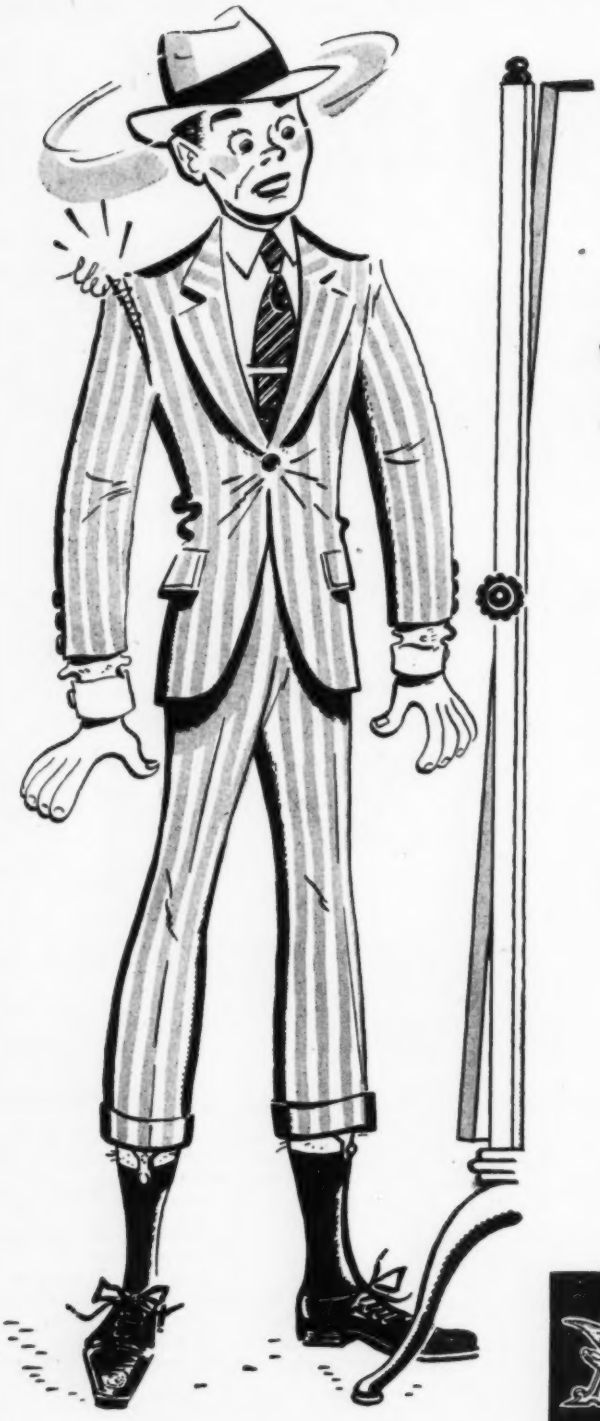
1. Two zones are provided; mixing zone below, clarifying zone above, separated by inclined baffles.
2. Raw water is uniformly distributed into mixing zone. Clarified water is collected evenly by a circular flume at the top periphery (plus radial flumes on larger diameter units).
3. Chemicals are introduced at the point where raw water enters, mixing chemicals, water and slurry simultaneously.
4. Variable speed agitator insures uniform, constantly agitated slurry mixture.
5. Slurry passes from mixing zone through ports in the baffles into the clarifying zone. A large central port plus a small peripheral port avoids conflict of rising water with the returning sludge from the clarifying to the mixing zone.
6. Slurry spreads out across full area of tank above crest of baffles, water rising slowly to separate from sludge.
7. Slurry spills over edge of baffles into sludge concentrator, settling and thickening and being withdrawn at intervals through diaphragm-operated valve.
8. Duration of desludging is controlled by timer. Automatic back-flushing of sludge collector pipe is also provided.

COCHRANE CORPORATION • 3114 N. 17th St. • Philadelphia 32, Pa.

In Canada: Canadian General Electric Co., Ltd., Toronto • In Mexico: Babcock & Wilcox de Mexico, S. A., Mexico City • In Europe: Recuperation Thermique & Epuration, Paris

COCHRANE





Not everybody takes a "Regular"

As a matter of fact, some men can't find a really perfect fit unless they have their suits tailor-made.

It's that way with the supplies you buy, too. For instance, we have a complete line of standard starches and other corn products for paper mill use; but we are *also* set up to provide you with any *special* formula or product, *tailor-made* to your specifications.

And . . . standard or special . . . you'll want to buy from a company like Anheuser-Busch, whose reputation for products of highest quality, uniformity and dependability is as dominant in the paper industry as it is with retailers and consumers all over the world.

CORN STARCHES
DEXTRINES
GUMS
CORN SYRUPS

FOR FURTHER INFORMATION PHONE OR WRITE

ANHEUSER-BUSCH, INC.

CORN PRODUCTS DEPARTMENT

ST. LOUIS, MO.

Gain a larger share of the business ahead

with

RICE BARTON
Engineering and Equipment

Yes, a huge market awaits all kinds of pulp and paper products. But — your profits will be influenced largely by your ability to keep costs down while meeting these needs. This means that improved methods and mechanical equipment rate a high priority in your thinking . . . whether in terms of a complete machine or any segment from wet end to dry end. Nowhere are technological improvements more evident than in Rice Barton equipment.

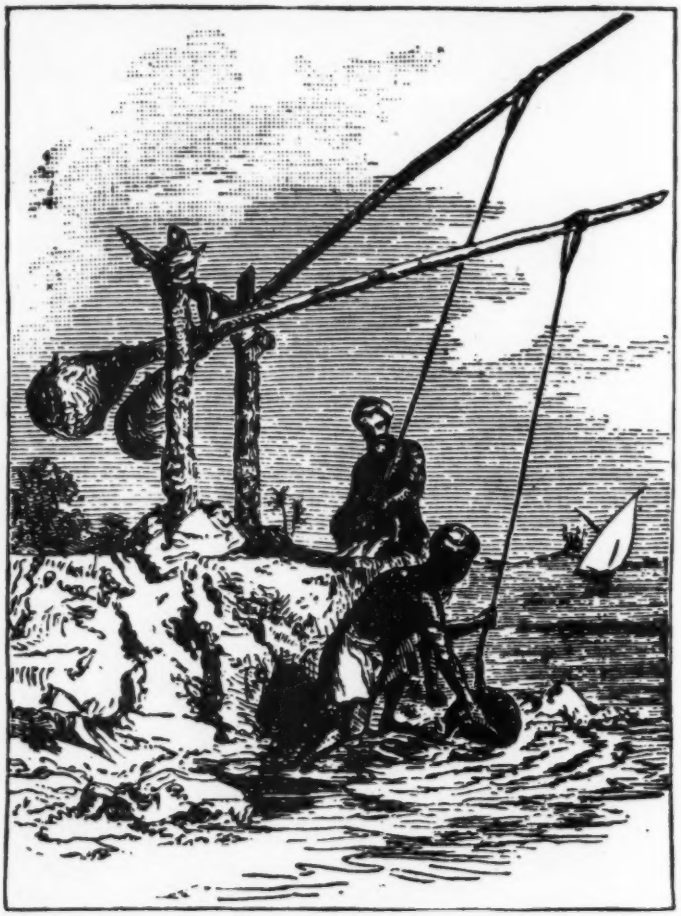
Let us work with *you* on your problem.

RB-2

RICE BARTON CORPORATION

WORCESTER, MASSACHUSETTS

The Pump that wasn't a pump



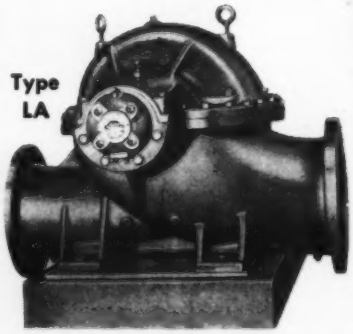
For many years this peculiar looking contrivance was the most efficient means known for moving water from one level to another—but it wasn't really a pump, it was a "shadoof".

Though still used today in many parts of the world, this hand-operated "bailing lever" is said to have been used 3000 years ago by the ancient Babylonians. On the basis of six strokes a minute, with a bucket that held 60 pounds of water, it could raise 36 gallons per minute. Those "bags" on the short end are used as counterpoises to lift the filled vessels.

If this were 3000 BC and you were looking for a pump for *any* purpose, the best Worthington could do for you would be to recommend a shadoof. The drive? Only *one* available—a husky slave.

Almost fantastic, isn't it, that crude devices like the shadoof, the mechanical innovations of their day, were the starting points for modern Worthington pumps—centrifugal pumps that can move as much as 250,000 gallons per minute; individual designs with 100,000 standard combinations of capacities, heads, casings, and mountings for *any* drive available; single-stage, multi-stage, volute, turbine, horizontal, vertical, Mixflo, Axiflo and regenerative pumps—for virtually every need of utilities, petroleum, paper, sugar, food, chemical, marine, water works, metal-working, and many other industries.

Yes, there's a Worthington pump for your requirement—a pump that's *standard* with Worthington. To find out about it, consult your nearest Worthington District Office or write to Worthington Pump and Machinery Corp., Centrifugal Pump Div., Harrison, N. J.

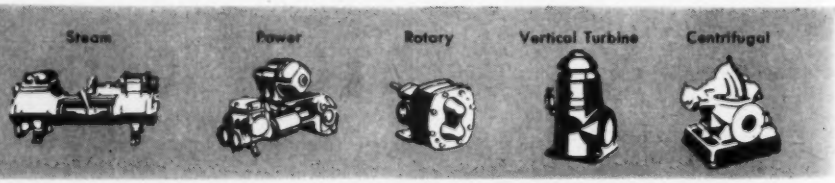


When you buy Worthington centrifugal pumps—the most complete line you'll ever find—you'll always be assured of the *right* pump for every job. Typical of this broad Worthington line is this large LA (to 60,000 gpm) at left; monobloc DN pump (to 2500 gpm), center; and the CN, frame-mounted version of the DN, in over 10,000 combinations.

WORTHINGTON

C.1.10

THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB



Immediate delivery on warehouse lots of 2 TIMKEN® steels that do 90% of your hollow parts jobs!

1. 52100 TUBING (101 STOCK SIZES)

A high carbon chrome, direct quenching steel which gives through hardness in moderate sections. Typical uses: aircraft engine parts, slitter knives, bearing races, pump plungers, collets, bushings, spindles, drilling machine quills, mechanical seal rings.

2. "NICKEL-MOLY" TUBING (52 STOCK SIZES)

A low carbon nickel-moly, carburizing steel which gives high surface hardness with a tough core. Typical uses: piston pins, bearing races, farm equipment and knitting machinery parts, sleeves, bushings, pump plungers, perforating guns.

NEED steel tubing in a hurry for your hollow parts jobs? These two Timken® steels may help you. They'll do about 90% of your hollow parts jobs. And we can give you immediate delivery on warehouse lots.

Timken 52100 and "Nickel-Moly" steels are general purpose steels which have good hardenability and wear resistance. Timken 52100 steel can often be substituted for costlier steel. It can be heat treated to file hardness and tempered back to any desired point. In moderate sections, it is through-hardening. There are 101 sizes of 52100 tubing ranging from approximately 1" to 10½" O.D.

"Nickel-Moly" is a fine-grained carburizing steel with exceptional stamina and shock absorbing qualities when heat treated. It develops high case hardness and a tough core. It is available in 52 sizes, ranging from approximately 1⅜" to 10¼" O.D.

With both these steels, you're sure of top quality and uniformity—from tube to tube and order to order—because of the Timken Company's rigid quality controls. Write on your company letterhead for stock list. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

Purecal is smooth

You've got real selling points when you use Purecal* M to make your paper. The coating's smooth — high in ink receptivity and low in plate wear. And that means a lot to your customers. They get better reproduction. Their plates last longer.

Why is Purecal M so effective? Well, it *has* high purity and completeness of dispersion. And it *hasn't* the abrasive particles found in other pigments. As a matter of record, in Bekk's smoothness test, Purecal M rated far superior to other pigments.

But see for yourself. Put a sample of Purecal M through its paces. You'll find that even a partial replacement of other pigments with Purecal M will increase the smoothness of the coating film.

Want the full story on why Purecal M will do a good job for you? Write us — we'll be glad to tell you and send you a sample.

*Trademark

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA
CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE
HYDROGEN • DRY ICE • SYNTHETIC DETERGENTS • GLYCOLS
CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE • PROPYLENE
DICHLORIDE • AROMATIC SULFONIC ACID DERIVATIVES
OTHER ORGANIC AND INORGANIC CHEMICALS

Wyandotte CHEMICALS
REG. U.S. PAT. OFF.
WYANDOTTE, MICH.
Offices in Principal Cities

NOW YOU CAN CONVERT BARK INTO PROFIT WITH THE VERSATILE FULTON ROLL PRESS

***de-waters* and *reduces* mill refuse to more efficient fuel or by-product . . . in one continuous, low-cost operation**

With the FULTON ROLL PRESS, that pile of soggy bark, knots and screenings is quickly changed from a liability to an asset. This remarkable machine, perfected by the world's leading builder of sugar cane milling equipment after 99 years of experience, will:

• **DE-WATER** your bark, mill refuse and all kinds of fibrous material far more efficiently than conventional methods . . . convert them into more easily-processed by-products or money-saving fuel.

• **REDUCE** your knots and screenings for redigestion or refining . . . eliminating much of today's waste.

MAIL COUPON TODAY for full details and free test run of your material

Fulton Iron Works Company, *Dept.* 1251
1259 Delaware Ave., St. Louis 14, Mo.
Please send full details of FULTON ROLL PRESS
☐ We are interested in FREE test run of.....
NAME.....
FIRM.....
ADDRESS.....
CITY.....ZONE.....STATE.....

Now more important than ever to you...

Fast LOCAL delivery

Convenient LOCAL warehouses

On-the-spot LOCAL lubrication engineering

Standard's LOCAL Lubrication service

• Wherever you are located in the Midwest, there's a Standard service-supply center close at hand. That means prompt delivery of Standard products, immediate assistance from a Standard lubrication specialist.

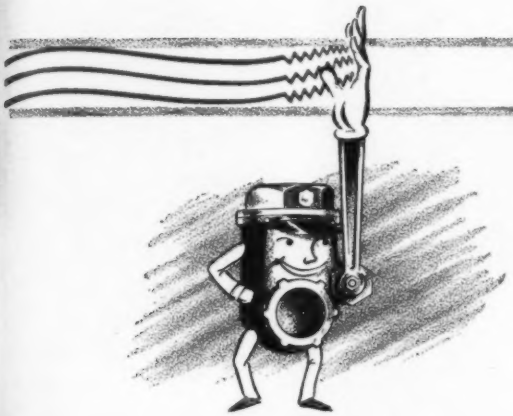
There's no need to worry over possible production delays due to lack of the right cutting oil, lubricant, or fuel . . . no need to stock-pile these supplies in your own plant . . . no need to wait for help in solving your lubrication problems.

To take advantage of Standard's time-saving *local* lubrication service (now more important than ever to you) call the Standard office in your area. Or write: Standard Oil Company (Ind.), 910 South Michigan Avenue, Chicago 80, Ill.

STANDARD OIL COMPANY STANDARD (INDIANA)

Specify this Fast-action Gate for quick, sure STOP and GO services

JENKINS



BRONZE GATE VALVE

125 lbs. Steam
200 lbs. O.W.G.
½" to 2"

Wherever full, free flow is essential . . . where valve opening and closing must be instantaneous . . . Jenkins SWINGTITE Fast-Action Bronze Gate Valves are setting new standards of performance and endurance.

The exclusive rolling disc and guide track design in the new Jenkins SWINGTITE distributes the wear, assuring maximum tightness (since it prevents uneven wear of seating surfaces), and lengthens valve life.

Use the SWINGTITE wherever fast-action valves take a beating on your processing lines. Compare it for long life and low maintenance. Prove for yourself that day after day it opens freely for full flow, and, closed, it seats tight and *stays* tight.

Ask your Jenkins Distributor for the folder, Form No. 196, describing the SWINGTITE in detail. Or write: Jenkins Bros., 100 Park Ave., New York 17; Jenkins Bros., Ltd., Montreal.

SOLD THROUGH LEADING INDUSTRIAL DISTRIBUTORS

SETTING NEW RECORDS FOR LONG LIFE AND LOW MAINTENANCE IN

- Oil refineries
- Textile finishing plants
- Chemical and food plants
- Pulp and paper mills
- Mines and mineral refining

AND IN SUCH APPARATUS AS

- Laundry machinery
- Dish-washing equipment
- Gasoline and fuel oil lines on motors, burners, etc.
- Fire extinguishing steam lines

ONLY THE SWINGTITE HAS IT—

ROLLER ACTION

As the valve is opened or closed, guide rims (A) around the seating surfaces of discs roll freely over guide tracks (B) cast in the body, distributing wear evenly, dislodging foreign matter, and providing a polishing action for seating surfaces. This rolling disc and track construction lengthens valve life and assures maximum tightness.

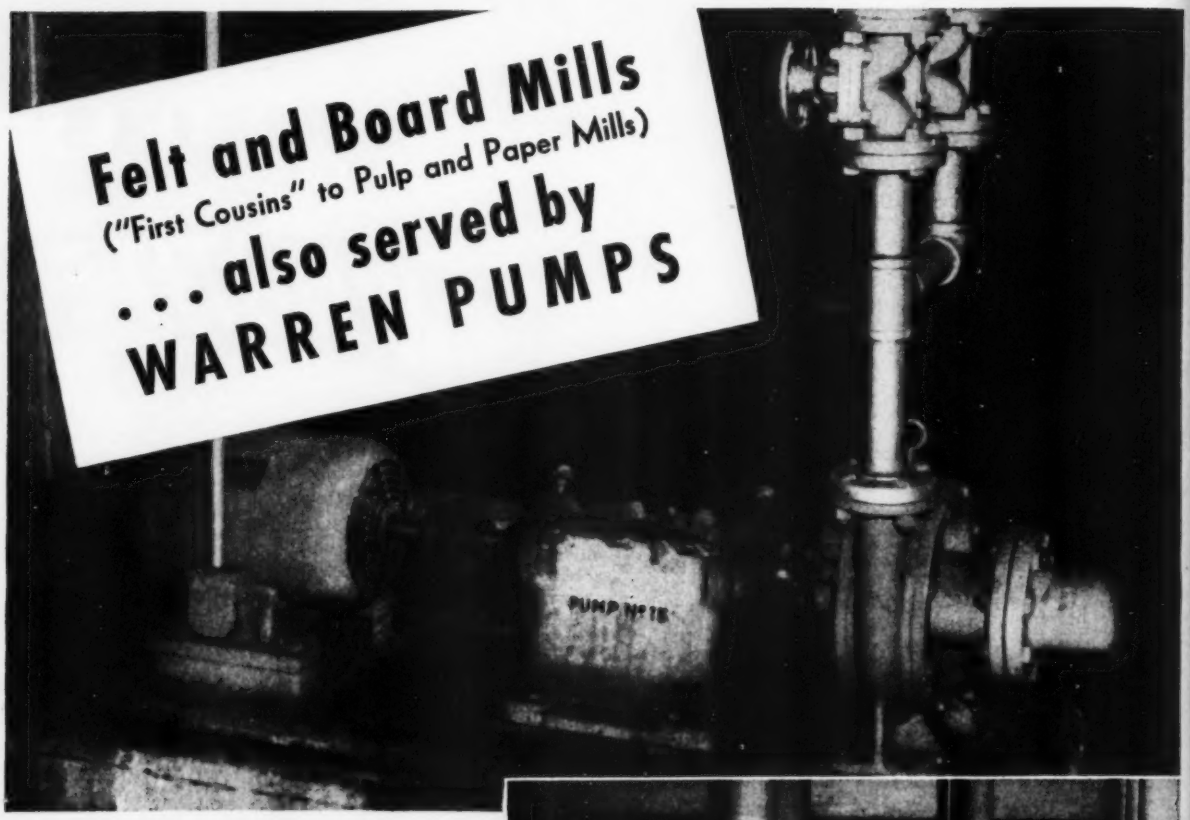
JENKINS VALVES

LOOK FOR THE DIAMOND MARK

SINCE 1864 TRADE JENKINS MARK

Jenkins Bros

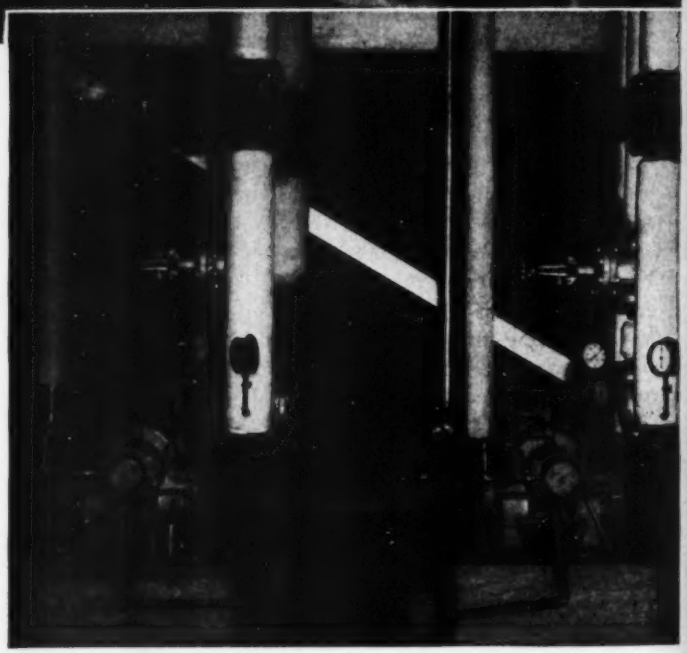
Felt and Board Mills
("First Cousins" to Pulp and Paper Mills)
. . . also served by WARREN PUMPS



. . . and keeping pace with expansion and improved production methods is Bird & Son, Inc., East Walpole, Mass., Phillipsdale, R. I., Chicago, Ill., and now a new felt mill at Shreveport, La.

Over the years it has been our privilege to have supplied the Bird mills with Warren Pumps for various types of services and our installations in the new Shreveport plant include pumps for handling:

- 3½% Dirty wastepaper stock
- 3½% Semi-liquid chemical wood stock
- 3½% Refined liquid felt stock
- White water
- Fresh water
- 10% Caustic solution
- Boiler Feed
- Boiler make-up water



Top: Warren Pump Handling Caustic Solution. Bottom: Boiler Feed Water Pumps

Modernization or expansion, Process or Power Plant, Pulp, Paper Felt or Board Mills . . . it will pay you too, to specify:

WARREN PUMPS

WARREN STEAM PUMP COMPANY, INC., WARREN, MASSACHUSETTS

INSUL-MASTIC Coatings

As Spectacular as the jobs they serve

This huge steel monument looks out over seven counties in Pennsylvania, Ohio and West Virginia. The cross is the fulfillment of a dream of Reverend W. L. Hogg, D. D., of Uniontown. The man swinging in the sky is spraying it with a white Insul-Mastic coating to beautify and to prevent rusting.

All Insul-Mastic coatings are homogenized and are manufactured with two particular objectives: to resist all corrosive agents...from moisture to acids...and to have exceptionally long life. In addition to these qualities, certain Insul-Mastic coatings contain cork and are excellent insulators. Other uses for Insul-Mastic are vaporsealing thermal insulation and moisture sealing building walls.

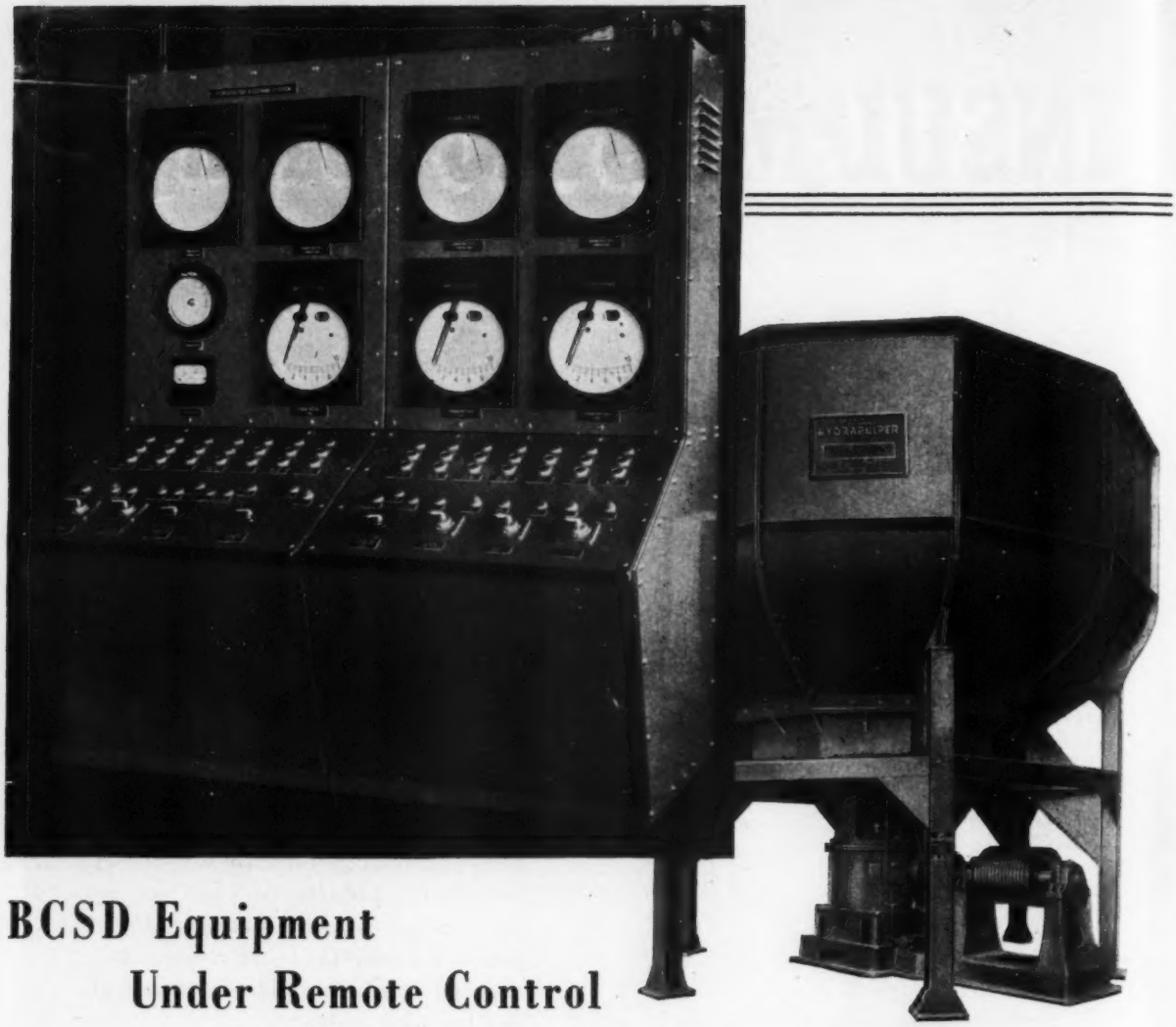
Insul-Mastic's outstanding quality is the reason for its place on the most spectacular...and exacting...projects where protection of metal, masonry or insulation is important.

Write for complete information and the name of our nearest representative.

Think first of the coatings that last!

Insul-Mastic Corporation
OF AMERICA
1157 OLIVER BUILDING · PITTSBURGH 22, PA.
Representatives in Principal Cities

INSUL-MASTIC COATINGS
CORROSION PROOFING
WATERPROOFING
VAPOR SEALING
INSULATION



BCSD Equipment Under Remote Control

Typical of the emphasis placed on remote control of both individual equipment and entire systems at B-C-S-D is the above panel board.

Here is a board that controls a de-inking system recently installed in a midwest mill.

In other mills pulping, stock cleaning, valve operation and many other operations are also remotely controlled from Shartle boards.

Even the plug settings of HYDRAFINERS and Miami jordans are remotely controlled—via Duotrol.

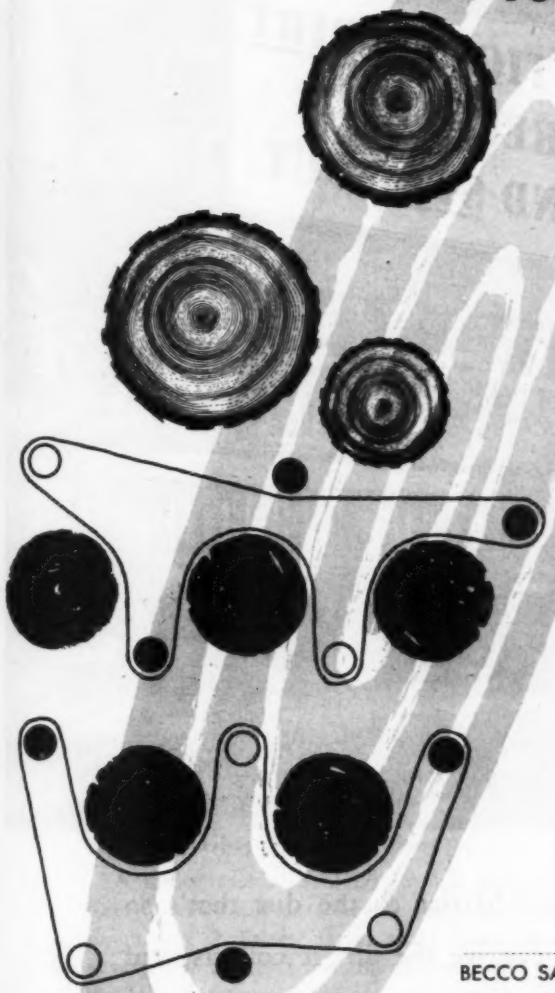
To carry the theme still farther, today's Black-Clawson paper machine designs particularly emphasize remote control of operations all the way from vats or Fourdrinier on thru to finishing.

If it is a B-C-S-D machine or combination of machines it will, if at all possible, be panel board operated.

SHARTLE BROTHERS MACHINE COMPANY, MIDDLETOWN, OHIO

DILTS MACHINE WORKS, Fulton, New York • *Divisions of* THE BLACK-CLAWSON CO., Hamilton, Ohio
Western Sales Office: Mayer Bldg., Portland, Oregon • *Southern Sales Office:* 937 Coventry Road, Decatur, Georgia
Associate: THE ALEXANDER FLECK LTD., Ottawa, Ont. • *Subsidiary:* B-C INTERNATIONAL LTD., Greener House, Haymarket, London, S. W. 1, Eng.

USE BECCO HYDROGEN PEROXIDE



FOR Low, Moderate or
High Density Bleaching
Continuous or Batch Bleaching
Steep Bleaching
Super-Bleaching
Paper Machine Bleaching
De-Inking

OF Groundwood
Chemigroundwood
Semi-Chemicals
Sulfite
Sulfate
Soda
Agricultural Residues
Flax
Bamboo

BECCO SALES CORPORATION, Station B, Buffalo 7, N. Y.

Please send me information on: _____

_____

NAME _____

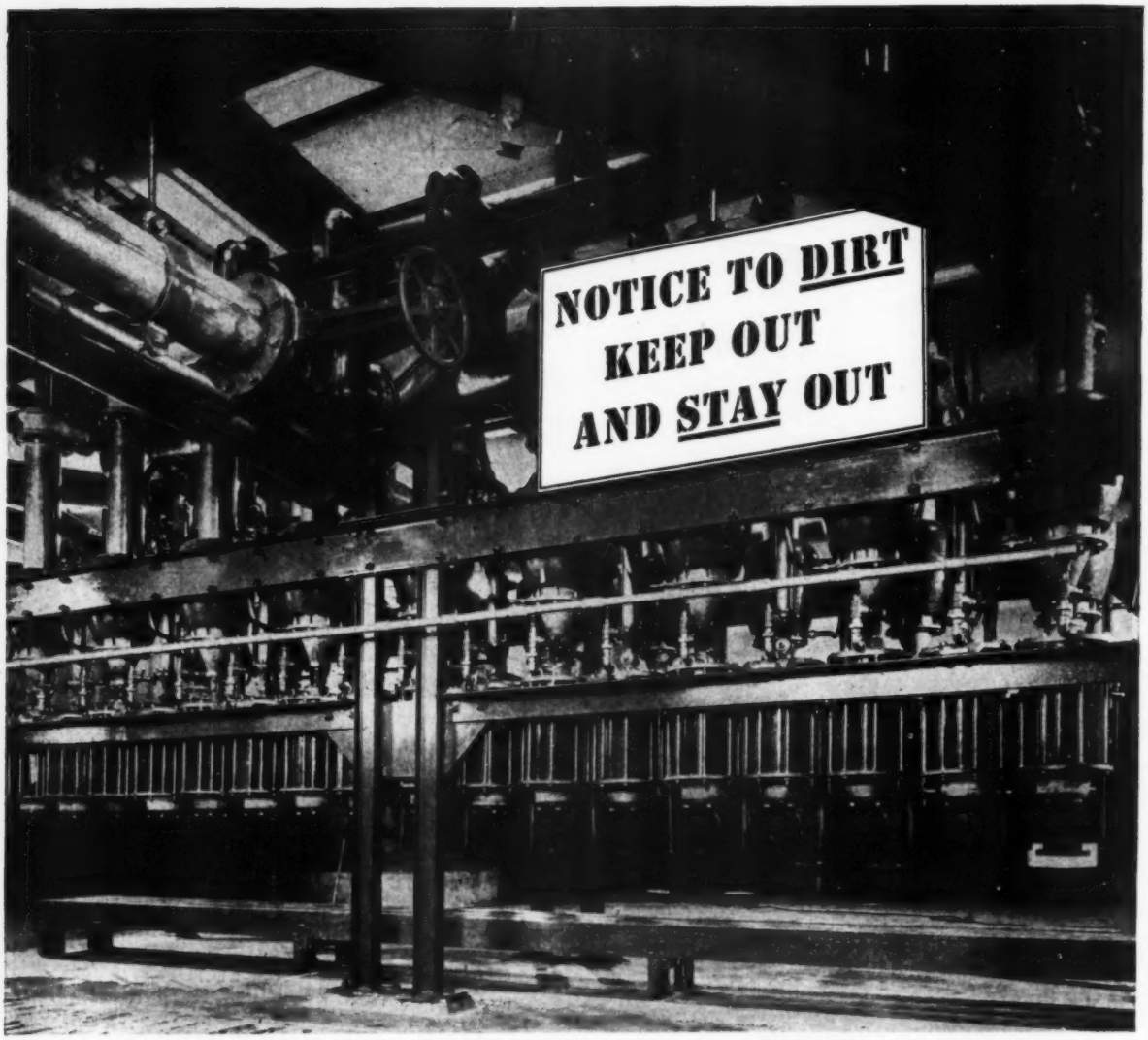
COMPANY _____

STREET _____

CITY _____ ZONE ____ STATE _____ PI-12-51

BECCO SALES CORPORATION

Sales Agent for BUFFALO ELECTRO-CHEMICAL COMPANY, INC.
BUFFALO · BOSTON · CHARLOTTE · CHICAGO · NEW YORK · PHILADELPHIA · VANCOUVER, WASH.



DIRTECS provide the most effective barrier to the dirt that's so prevalent in paper stock today. You can see the dirt it collects, and remove it quickly and completely. It cannot get back into the system.

DIRTECS also guard your machine wires against those sharp, gritty particles that wear them out before their time.

To maintain maximum output of dirt-free paper, you need DIRTECS.

BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS

The Paper Industry

December 1951

Wanted: scrap for defense

The pulp and paper industry has underway, and on its drawing boards, one of the greatest expansion and modernization programs in its entire history. With about $500,000,000 being spent, this program encompasses complete new mills; new paper machines, pulping equipment, power plants, etc., for enlarging the production of existing mills; and modernization projects for rebuilding and refurbishing old mills. Recognition of the essentiality of paper and paperboard products to the defense effort and to the civilian economy of our country is indicated by the large number of certificates of necessity granted for pulp and paper expansion.

Machinery deliveries may slow down

A major factor involved in this program being carried out on schedule rests with the machinery builders, large and small, who supply the many thousands of items that go into the construction of a modern pulp and paper mill. In the face of even greater diversion of scarce materials for defense purposes, it is altogether likely that machinery builders will be forced to curtail their output of paper mill equipment due to a lack of strategic material such as steel, copper and other metals.

Scrap inventories low

Inventories of heavy iron and steel scrap at the country's steel mills and foundries are dangerously low. What several months ago was a shortage is today an emergency. Supplies on hand are sufficient only to cover the requirements of days and weeks instead of about two months, which is considered a safe normal working inventory.

Why do we need scrap?

Here's the answer: Steel is made half from pig iron, half from scrap (about half the scrap is purchased from scrap collecting agencies while the other half is production scrap from steel mill and foundry operations). Back in 1950 our steel industry produced 97,800,000 tons; in 1951 we produced at the rate of about 107,000,000 tons; and in 1952 production of steel is expected to go to about 119,500,000 tons. So it's easy to see why the need for scrap has increased. In 1950, purchased scrap consumed amounted to 29,500,000 tons and the 1952 requirements are expected to be over 36,000,000 tons.

Junk idle equipment

Today, not enough scrap is being gathered from normal sources to meet the demands of increased steel production. The only way steel mills and foundries can get the scrap they require for increased defense and industry needs is for each individual person and business to lend a hand. To help in this emergency, search your mill or plant for metal scrap —obsolete machinery, no-longer-used equipment, worn out or broken chain, wheels, pulleys, valves, pumps, pipe, abandoned metal structures, and countless other items that are taking up valuable space and cluttering up your store rooms. Chances are you'll never use them so why not get rid of them.

Help defense—help yourself

With iron and steel scrap so urgently needed, it's time to take another look through your own plant and storage yard. You should find tons of metal that, if channeled back to steel mills and foundries, may well help you get better deliveries on the new equipment for your own expansion program.

SARCO SCRAPER STRAINERS

—PREVENT WORK STOPPAGES . . . SAVE TIME

The three six inch scraper strainers shown above are insuring a usable water supply 24 hours a day in this busy Detroit paper mill—it is river water which at times is full of debris. Pressure gauges tell the operator when the strainer needs scraping. Then, a few turns of the handles remove all material from the screens and the water pressure becomes normal again.

There are many uses for this Sarco product. Foods and chemicals are run through screens of varying sizes just before packaging. Hot liquids, such as wax and auto frame paint, are purified, and the exhaust steam containing lint from steam hammers is made suitable for use in unit heaters in a large Cleveland metal plant.

Scraper Strainers are available in sizes from ¾" to 8", up to 200 lbs. pressure, hand or motor operated. Bodies, screens and rotors can be made of any metal needed for the application. Ask for Catalog No. 1225.

PAINT FILLING

VARNISH

STEAM

OIL

HOT WAX

327

SARCO SAVES STEAM

SARCO COMPANY, INC.

Represented in Principal Cities

Empire State Building, New York 1, N. Y.

SARCO CANADA, LTD., TORONTO 5, ONTARIO

IMPROVES PRODUCT QUALITY AND OUTPUT

ds,
ed,
am
ers

/4"
tor
ade
for

327

1951

The Paper Industry Current Comment

Pulp imports decline

The pulp import situation, as regards shipments from Scandinavia, has depreciated rapidly and the prospects for 1952 are far from bright, especially as under present conditions world prices are above the United States ceilings.

Washington officials are reported to be considering a rollback on prices of imported pulp in the face of the fact that imports from Sweden have been running at about one-third of the 1950 rate. Actual receipts in 1951 will be about three-quarters of the anticipated shipments, and reports from Europe are that schedules for 1952 shipments of Scandinavian pulp will be at about the same low level as during the latter months of 1951. In recent months receipts have been only about half the volume called for by American buyers' contracts, but imports from Canada have continued at a normal rate.

However, the situation of domestic converter mills is far less serious than would have been the case if consumer demand for paper had continued at the levels of the early months of 1951.

Paper demand leveling off

There is a definite downward trend in the demand for most grades of paper, as well as a marked drop in the paperboard field. The backlogs of orders at the mills are being cut down to more normal levels, and were it not for the earlier heavy volume of unfilled orders the paper industry would have reflected more quickly the poor business in such industries as the textiles.

Speculative offerings of paper at high prices have largely disappeared. Mill salesmen are looking for orders, and for the first time in recent months there have been cancellations of mill orders.

Kraft appears to have resisted the lower trend more than other grades, and in other fields manufacturers are reported to be leaning toward a policy of reduced output, rather than price reductions below existing ceilings.

Price ceilings established

During the past month there has been material clarification of the price picture for many grades of paper, by the establishment of ceiling prices for a wide number of grades. These ceilings as a general rule are at about the average prices of the period from December 19, 1950, to January 25, 1951. Page after page of government orders have been issued, and in the single case of writing and other fine papers there were issued no less than half a hundred spelled out dollars-and-cents prices for various grades, ranging from rag content bonds to chemical printing papers. In this series papers with an annual value of nearly $400,000,000 were covered. Conferences with other producing groups are being held constantly in an effort to bring the major portion of the paper industry under so-called tailored orders.

Meanwhile, similar conferences are being held in an effort to avoid the restriction on the use of basic supplies, such as sulphur, Fourdrinier wires and other necessities. In some cases due consideration has been given to the needs of the paper industry, but in other cases the problems are still in a state of flux. Fears of a restriction on the use of chlorine, with resultant decrease in brightness of various papers, have been alleviated, at least temporarily. With the nation approaching, though ever so slowly, a restrictive defense manufacture status, there can only be guesses as to future developments.

Paper industry aids forestry

A Forest Service official report recentlyissued again points up the manner in which paper industry enterprise has been the salvation of the southern forests. The South is now producing 60 percent of the total United States yield of pulpwood, and also leads all other regions in the mill capacity to convert this wood into pulp. At the same time, the forestry management programs of the paper companies, large and small, are bringing the forests into a perpetual crop economy, under which proper care of the timber lands is reaching the point at which growth of wood is greater than the actual cut, if in fact this ratio does not already exist in many regions.

The Federal Trade Commission will crack down on corporate mergers as provided by a 1950 amendment to the antitrust laws. Shortly before Congress adjourned in October it voted an appropriation to provide for the enforcement of the law, and FTC staff members have been ordered to proceed promptly with investigations of a number of recent mergers. The new provisions extend the Clayton Act to include mergers accomplished by the purchase of one corporation's physical assets when such a merger may have the effect of substantially lessening competition or of creating a monopoly. The original law barred only mergers resulting from the acquisition of stock.

Labor renews drive

The labor union drive for another round of wage increases is well under way, with the steel industry first to face wide spread demands for contract changes. It would seem that the spiral of increased wages and consequent higher prices to consumers must at some time reach such a height that it will topple of its own weight. Apparently that point has not yet been reached.

Financial reports

Although reports of earnings by paper companies for the first nine months of 1951 generally show an increase over the earnings for the same period in 1950, reports for the third quarter generally show decreased profits, despite heavier sales, as a result of the increased tax burden. A falling market for securities has had its repercussions in the paper field, though not so large a drop percentagewise. Generally the tendency is for accumulation by investors of common stocks rather than in the fixed dividend preferred stock and bond fields.

Net incomes

American Writing Paper Corp.—Net income for nine months ended September 30 was $443,026, as compared with $241,694 for the same period in 1950.

Certain-Teed Products Corp.—Net income for nine months ended September 30 was $3,737,463, compared with $4,284,117 during the corresponding period last year.

Chesapeake Corp. of Virginia—Net income for 40 weeks ended October 7 was $4,965,907, as compared with $2,298,326 a year ago.

Container Corp.—Net income for nine months ended September 30 was $46,-

NOW
A NEW REFLECTANCE ACCESSORY
that simplifies color evaluation
Easily Installed
The attachment consists of an integrating sphere in holder and a sliding sample tray which are easily installed in place of the standard Model B sample compartment and cell carriage.
Precise Measurements
To permit utmost measurement precision, a detent mechanism operated by a convenient push button in the sample tray knob exactly reproduces forward and backward position of the sliding sample tray. The resulting precision is particularly valuable for accurate measurements on samples with rough surfaces or non-homogenous colors.
Readings taken rapidly are reproducible to at least 1%—with careful technique even greater precision is obtained.
Operating Convenience
Special provision has been made so that liquid samples can be conveniently inserted without spilling . . . powdered samples without disturbing the smoothed surface.
Sample Size
Sample size is approximately 1" x 1 1/4" with a maximum thickness of 5/16"—ample for most applications. Or, by simply rotating the sphere 180° in its holder, larger samples can easily be accommodated.
Quick, Easy Readings
Accurate color measurements are made with great speed and simplicity. First the instrument is adjusted to read 100% reflectance on a white standard (such as MgO), the sample is moved into position and the percent reflectance (compared to the standard) is then read directly from the meter. It's as simple as that—and the three-compartment sample tray permits quick comparison of two samples and a standard on each run.
BECKMAN
INSTRUMENTS

602,321, as against $47,692,624 last year.

Continental Diamond Fibre Corp.—Net income for the first three quarters of 1951 was $865,156, compared with $791,174 in 1950.

Dixie Cup Co.—Net income for the first nine months of the year was $2,161,915.

Eastern Corp.—Net income for nine months ended September 30 was $1,615,583, compared with $1,007,344 a year ago.

Gaylord Container Corp.—Net income for the first nine months of 1951 was $6,245,512 against $3,757,680 last year.

General Box Co.—Net income for the first nine months was $832,499, compared with $408,099 for the corresponding period last year.

Great Northern Paper Co.—Net income for the first three quarters of 1951 was $3,391,780, compared with $2,844,675 a year ago.

St. Regis Paper Co.—Net income for the nine months ended September 30 was $12,796,676, as compared with $7,003,924 for the same period in 1950.

Soundview Pulp Co.—Net income for the nine months ending September 30 was $3,787,870. For the corresponding period last year the net income was $3,540,410.

United Board & Carton Corp.—Net income for the 12 weeks ended August 18 was $240,093, as compared with $63,278 for the comparable period a year ago.

Dividend declarations

Celotex Corp. has declared a quarterly dividend of 37½ cents and an extra of 37½ cents on the common, both payable October 31 to stockholders of record October 8.

Consolidated Paper Co. has voted a 75 per cent dividend payable December 1 to stock of record November 19.

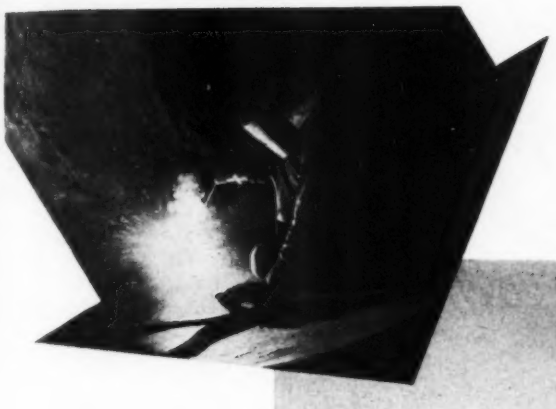
Mead Corp. has declared an extra of 40 cents and the usual quarterly dividend of 40 cents on the common, both payable December 1 to holders of record November 13.

Morris Paper Mills has voted a stock dividend of 3 per cent and the regular quarterly dividend of 50 cents on the common, both payable December 10 to stockholders of record November 19.

Northern Paper Mills has declared a dividend of $1 per share plus a 25-cent extra for the last quarter, also $1.50 a share on the 6 per cent preferred, both payable December 10 to stock of record November 20.

River Raisin Paper Co. paid a 20 per cent dividend October 19 to stockholders of record October 5.

Robert Gair Co. Inc. has declared the regular quarterly dividend of 25 cents



CAREFUL FABRICATION assures more efficient PERFORMANCE

This 11-ft. 2 in. diam. by 34-ft. 4-9/16 in. digester is loaded for shipment to the Weyerhaeuser Timber Company at Longview, Washington. It was built by Chicago Bridge & Iron at their Birmingham, Alabama plant.

The Horton* digester in the above view is one of four we built at our Birmingham, Ala., plant for the Weyerhaeuser Timber Company at Longview, Washington. They are made of A-212, Grade B, Firebox quality steel and have a 15 per cent Type 316 C B stainless steel, cladding on the inside.

Supplying digesters, chip tanks, blow tanks, seal tanks, accumulators, acid tanks, storage tanks, elevated water tanks and Marx Savealls made of carbon steel is a regular part of our business. We are also equipped to build structures from special metals to meet your specifications. There are stress relieving facilities at three of our plants and we also have equipment to do x-raying.

When your plant requires new tanks or steel plate work to keep pace with the ever growing demand for paper products, investigate the experience and facilities of Chicago Bridge & Iron Company. There will be no obligation on your part.

** Trademark Registered U.S. Patent Office*

Horton Equipment for the Pulp and Paper Industry

chip tanks . . . blow tanks
elevated water tanks . . .
pulp tanks . . . Marx Savealls
sulphate digesters . . . .
accumulators . . . acid tanks
sulphite digesters . . . .

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3.....2143 Healey Building
Birmingham, 1.....1511 North 50th Street
Boston, 10.....1026—201 Devonshire Street
Chicago, 4.....2445 McCormick Building
Cleveland, 15.....2267 Guildhall Building
Detroit, 26.....1566 Lafayette Building
Houston, 2.....2143 C. & I. Life Building
Los Angeles, 17....1559 General Petroleum Building
New York, 6.....3350—165 Broadway Building
Philadelphia, 3....1653—1700 Walnut Street Building
Salt Lake City, 4.....527 West 17th South Street
San Francisco, 4.....1547—200 Bush Street
Seattle, 1.....1327 Henry Building
Tulsa, 3.....1651 Hunt Building
Washington 6, D.C.....1138 Cafritz Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

Control Costs with TOLEDO

On your scale material becomes money!

PRINTWEIGH STOPS ERRORS . . . Provides printed weight records—at the instant of weighing—assuring that the accurate indication of the Toledo dial will reach your accounting records without chance of human error.

Modern Toledos meet your needs today for *rapid, accurate* scales in all phases of production . . . to help you *control costs!*

These are the scales backed by Toledo's half-century of experience in Research and Engineering that has produced 80% of the major advances in scales during this time.

Toledo engineering has not only specialized in the direct design of weighing machine mechanisms, but also in the many associated fields such as electronics, plastics, metallurgy, optics.

Check your needs *now*—select Toledo equipment for vital jobs in guarding materials and costs! Sales and service in 200 cities. Toledo Scale Company, Toledo 1, Ohio. We will be very glad to send catalogs.

NEW!
FLOOR SCALES
New recessed frame design fully guards against foreign material lodging beneath platform edge—choice of full or semi frame, with economical conversion for future needs. Double parallel link platform suspension means long life, accurate dependability. Send for bulletin 2406C.

TOLEDO

HEADQUARTERS FOR SCALES

per share and an extra dividend of 20 cents on the common, both payable December 10 to holders of record November 19.

Scott Paper Co. has declared regular quarterly dividends of 85 cents on the $3.40 cumulative preferred and $1 on the $4 cumulative preferred, both payable February 1, 1952, to stockholders of record January 18.

United Board & Carton Corp. has declared an extra dividend of 10 cents on the common payable December 21 to stock of record December 7. The usual quarterly dividend of 25 cents was declared previously.

Paper mill corporate changes

Dixie Cup Co. stockholders have voted to increase authorized common from 600,000 to 1,200,000 shares and to effect a 2-for-1 stock split. The increase served to eliminate Class A stock, all shares of which had previously been redeemed. Approval was also granted a stock option plan covering key employees.

Oxford Paper Co. stock has been placed on the market through an investment firm which is forming a group to distribute 163,675 of the 300,044 common shares owned by Hugh J. Chisholm and 32,000 of the 64,000 owned by his wife. As a result of this sale, the Chisholm family's holdings will be reduced to about one quarter of the firm's stock.

Riegel Paper Corp. stockholders have been asked to approve a 2-for-1 stock split and to increase authorized common stock from 500,000 to 1,000,000 shares.

New York Stock Exchange—Stocks

(Closing Prices)

	Nov. 20, 1951	Oct. 20, 1951
A.P.W. Products	* 5⅝–6¼	6¼
Celotex	17⅞	18
Same Preferred	* 16¾–17⅛	17⅝
Certain-teed Products	16½	17
Champion P & F Co.	25½	* 27–27½
Same Preferred	* 99–100	*102¼–102½
Chesapeake Corp.	* 33–32½	37⅞
Continental Diamond	15	16
Container Corp.	35⅝	36⅜
Same Preferred	96½	* 98¾–100
Crown Zellerbach	49	54½
Same Preferred	97¾	*100¾–101⅝
Dixie Vortex	* 69–70	73⅝
Eastern Corp.	24¼	28
Robert Gair	17⅛	18⅝
Same Preferred	* 19¼–19⅛	* 19¼–19⅝
Gaylord Container	29⅞	31
International Paper	46	50
Same Preferred	* 98¼–99	* 98¼–100½
Kimberly-Clark	44	48
McAndrews & Forbes	42½	43½
Marathon	56⅜	53½
Masonite	37	37⅛
Mead Corp.	24¼	27⅝
Same Preferred	93	* 93–93⅝
Same 2nd Preferred		* 67–71
National Container	13⅝	13½
Rayonier, Inc.	55¼	57⅞
Same Preferred	35	* 36¾–37¼
Scott Paper	48	* 52¼–53¼
Same $3.40 Preferred	89	* 90–92
Same $4.00 Preferred	101	*100–100⅞
St. Regis	16¾	17⅝
Same Preferred	* 92–94	* 93–95
Sutherland Paper	22½	25½
Same Preferred	107¼	110
Union Bag & Paper Co.	45½	47¼
United Board & Carton	17⅝	18¼
United Wall Paper	3	3½
Same Preferred	* 24¾–25	25
U.S. Gypsum	111¼	*117¼–118
Same Preferred	*171¼–174	*171–174
West Va. P. & P. Co.	83⅝	* 81–83
Same Preferred	105½	*107–108½

New York Stock Exchange—Bonds

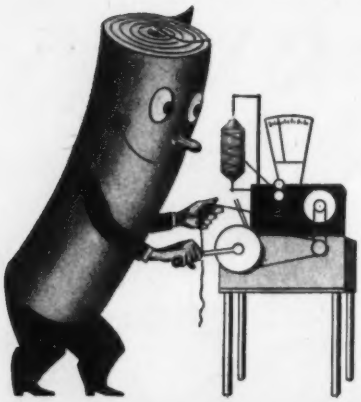
A. P. W. Products	.....	.....
Celotex 3¼%	.....	.....
Champion P. & F. Co. 3%	.....	.....
Mead Corp. 3%	.....	.....

New York Curb Exchange—Stocks

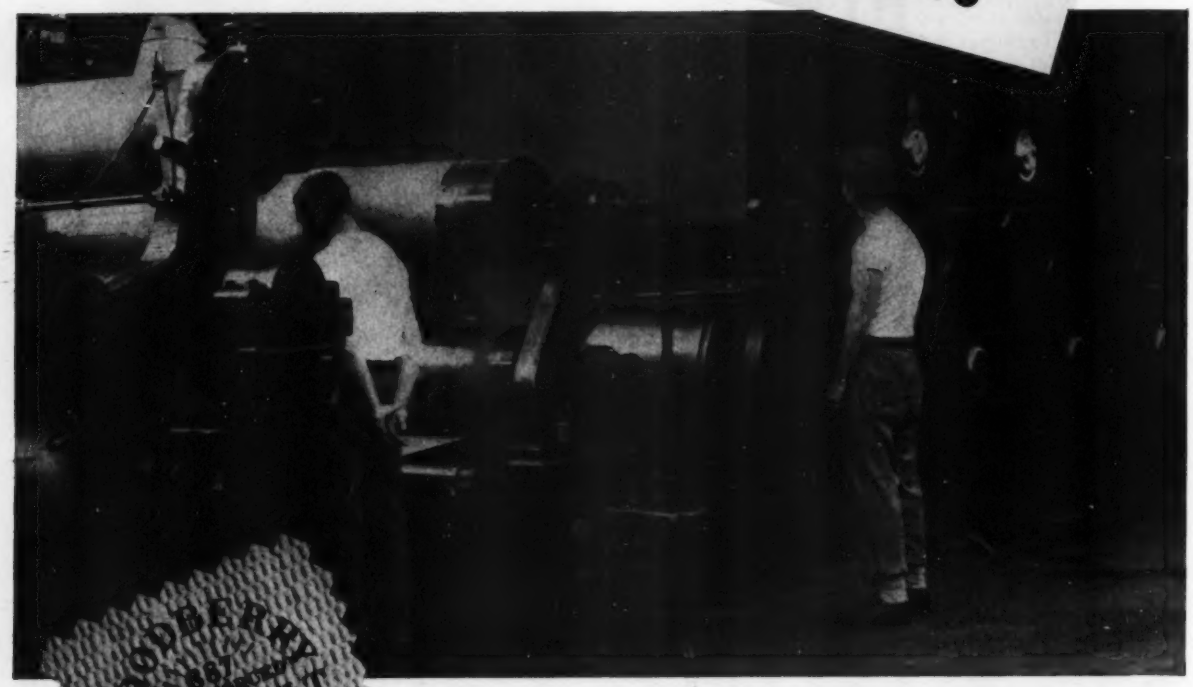
Am. Writing	12¼	11⅝
Great Northern	55½	55
Hammermill	35	40

*Closing Bid and Asked Prices.

POWELL
is more than
a name
It's the hallmark of better quality in valves. That means better performance, longer life and lower cost of maintenance.
Also because Powell makes the valve to suit the service, you have at least two reasons why there are more types of Powell Valves serving industry today *than any other make.*
Fig. 375—200-pound Bronze Gate Valve with renewable, wear-resisting "Powellium" nickel-bronze disc.
The Wm. Powell Co., Cincinnati 22, Ohio
POWELL
BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES
DEPENDABLE VALVES
SINCE 1846



SCIENTIFIC CONSTRUCTION Makes the Big Difference in DRYER FELTS



PATENTED

Gives You Scientific Construction

Asbestos yarns woven at scientifically determined intervals into the face of Woodberry 887 heavy duty dryer felts means longer wear, lower steam consumption, increased porosity, finer paper quality.

AT YOUR SERVICE

Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

Mt. Vernon - Woodberry Mills

TURNER HALSEY
COMPANY
Selling Agents
40 WORTH ST. NEW YORK

Branch Offices: Chicago • Atlanta • Baltimore
Boston • Los Angeles • Akron

CHECKING COEFFICIENT OF VARIATION And Average Factor Of Quality On Evenness In Roving With Beiger Tester. One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

The Paper Industry News of the Industry

World Newsprint Production at All-Time High

During 1950 newsprint production throughout the world broke all existing records. The output of more than 9,700,000 tons was, however, not equal to global requirements. Figures released by the Newsprint Service Bureau show that although the United States produced only slightly more than 10 per cent of the world total, nearly 60 per cent of new supply was available to consumers in this country.

Despite currency difficulties and governmental regulations affecting newsprint usage in some parts of the world a slightly larger share of the total new supply was available to nations other than the U.S. than was the case in 1949. In 1937 the relationship of U.S. production to that of the rest of the world was approximately the same as in 1950, but the then distribution pattern was quite dissimilar, with only 48 per cent available to users in this country and 52 per cent to all other consumers.

U. S. Leads in Gain

Only five countries recorded decreased production during 1950. In all other cases production of newsprint was equal to or more than the output of 1949. On a quantitative basis, the United States with increased production of 115,000 tons recorded the largest gain over 1949. Other nations reporting greater output, together with the respective increases, are as follows: Canada, 103,000 tons; United Kingdom, 91,000; Russia, 75,000; Germany, 67,000; France, 35,000; Finland, 32,000; Italy, 26,000; Japan, 25,000, and Sweden and Belgium, each 13,000. Australia was the principal producer to fall below 1949 levels.

Canada Outproduces World

Of the 1950 world total, 54 per cent was concentrated in Canada, which outproduced the rest of the world by more than 800,000 tons, and its nearest rival—the U.S.—by more than 4,250,000 tons. The Canadian figure would have been even greater had it not been for a temporarily lower newsprint demand during the first quarter of the year, when operations were below capacity levels. Next in rank was the U.S. with production of 1,015,000 tons, less than 1/5 that of Canada but 66 per cent more than the 609,000 tons made in the United Kingdom, which in turn exceeded Finland's output of 454,000 tons by 33 per cent.

U. S. S. R. a Question Mark

Since a minimum of accurate information is available from Russian sources, the production of that country as concerns the world picture is a question mark. Government reports from the U.S.S.R. have disclosed that production in 1950 was 47 per cent greater than in 1940, which would mean that last year's output of paper and board stood at approximately 1,310,000 tons.

The 1950 world production of newsprint estimated at 9,736,000 tons was 605,000 tons, or about 6½ per cent, greater than the previous peak, attained in 1949. The prewar high, reached in 1937, was exceeded by 856,000 tons, or 9½ per cent. Of the world total, North American production accounted for 6,294,000 tons, approximately 64½ per cent, while Europe, exclusive of Russia, turned out 2,766,000 tons, or nearly 28½ per cent. Estimated Russian production stood at 4½ per cent of the global total. The remaining 2½ per cent represented tonnage produced in Asia, South America, and Australia.

Distribution

It has been estimated that during 1950 the movement of newsprint in international trade may have exceeded 6,120,000 tons, or about 63 per cent of global production. This includes a reported 100,000 tons shipped between countries behind the Iron Curtain. Five nations accounted for approximately 97 per cent of the known world exports—Canada, Finland, Sweden, Norway, and the United Kingdom, each of which exported at least 100,000 tons of newsprint. The next largest exporters were Austria, 48,000 tons; U.S., 44,000; France, 26,000, and the Netherlands, 25,000. However, both the U.S. and the United Kingdom are officially classified as importers, since incoming newsprint exceeded exports in the case of the former by more than 4,800,000 tons and in the case of the latter by 40,000 tons.

Of the 4,938,000 tons exported by Canada, 4,724,000 went to the U.S. Other major recipients included: the United Kingdom and Ireland, 39,000 tons; Mexico, 33,000; New Zealand, 27,000; Cuba, 25,000; Venezuela, 10,000; Union of South Africa, 9,000; Colombia, 9,000; India and Pakistan, 9,000; Hawaii, 7,000; the West Indies, 6,000; Uruguay, 4,500; Chile, 4,000; Peru, 3,000; Western Germany, 2,000; Philippines, 2,000; British Malaya, 1,500; China, 1,300; Portugal, 1,000; Indonesia, 1,000; Brazil, 700; Argentina, 300, and Egypt, 300.

U.S. exports, totalling 44,000 tons, went primarily to Asia, where shipments to the Philippines, India, and Pakistan amounted to more than 23,000 tons. Some 19,000 tons were exported to Latin America, while less than 2,000 tons went to Europe. Exports to Mexico exceeded 7,000 tons, and those to Colombia, Cuba, and Venezuela 2,000 tons.

Finland exported some 415,000 tons, which were destined for the following countries: United States, 142,000 tons;

NEWS HIGHLIGHTS

World Newsprint Production....1023
Mill Expansion Plans....1025
Foreign Visitors Tour Mills....1029
Canadian Developments....1032
Sulphur Limitations Attacked....1035
Government Actions....1036
Pulp and Paper World Report..1036
Production Report....1044

United Kingdom, 78,000; Argentina, 44,000; Denmark, 29,000; Brazil, 28,000; India and Pakistan, 15,000; Australia, 10,000; Greece, 8,000; Egypt, 8,000; Italy, 7,000; Belgium, 6,000; Union of South Africa, 5,000; China, 4,000; Mexico, 3,000; Uruguay, 3,000; Peru, 3,000, and Turkey, 2,000.

Of the total Swedish export of 224,000 tons, 39,000 went to the United Kingdom; Argentina, 32,000; Australia, 32,000; U.S., 19,000; Brazil, 18,000; Uruguay, 14,000; Denmark, 13,000; Colombia, 8,000; Union of South Africa, 8,000; India and Pakistan, 6,000; Western Germany, 6,000; Portugal, 5,500; Egypt, 3,000; Cuba, 3,000; China, 2,000, and Turkey, 2,000.

Norway exported 158,000 tons of newsprint during 1950. The various nations receiving Norwegian exports were Argentina, 26,000 tons; United Kingdom, 21,000; Denmark, 17,000; India and Pakistan, 16,000; Brazil, 14,000; Union of South Africa, 8,000; Western Germany, 6,000; China, 6,000; Australia, 5,000; Belgium, 4,000; United States, 3,000, and Egypt, 1,000.

Of the 114,000 tons exported by the United Kingdom, Australia received 87,000 tons; New Zealand, 10,000, and the Union of South Africa, 9,000.

World Newsprint Production—Postwar and Prewar (Thousand Short Tons)

	Postwar		Prewar	
	1950	1946	1939	1935
Canada[1]	5,279	4,506	3,174	3,083
United States	1,015	771	939	912
United Kingdom	609	330	848	970
Finland	454	259	519	329
Sweden	358	290	305	298
France	327	133	276	358
Germany[2]	307*	150*	415	464
Norway	178	121	226	182
Japan	145	83	306	278
Italy	95	32	66	76
Netherlands	88	39	104	92
Austria	78	29	25	50
Belgium	68	35	54	48
Poland	52*	29	25	34
Switzerland	52	38	40	45
Czechoslovakia	50*	38	24	41
Australia	35	34	—	—
Brazil	31	9	6	—
Spain	25	15	21	42
China	20*	(?)	—	—
Chile	12	6	12	6
Hungary	10*	4	5	—
Turkey	7	(?)	—	—
Rumania	5*	(?)	(?)	(?)
Bulgaria	4*	(?)	2	—
Yugoslavia	3*	(?)	—	—
Portugal	3	3	—	—
Korea[3]	1*	(?)	(?)	(?)
Denmark	—	(?)	—	1
Argentina	—	(?)	—	—
Mexico	—	—	—	20
Russia[4]	425*	130*	210	203
Total	9,736	7,084	7,602	7,532

(1) Includes Newfoundland. (2) Includes estimated production in Eastern Germany of 120,000 tons in 1950 and 70,000 tons in 1946. (3) South of the 38th Parallel. (4) Includes Estonia, Latvia, and Lithuania. (*) Estimated.

Source: Newsprint Service Bureau, New York, N.Y.

Newsprint to be Declared Essential

A National Production Authority ruling declaring newsprint essential was expected before the end of November. The move would clear the way for a 250,000-ton expansion of producing capacity. Arthur R. Treanor, retiring as director of the NPA's Printing and Publishing Division, said that the ruling has been sought for many months.

Although newsprint will be in short supply for an indefinite period in spite of the gradual enlargement of mill capacities both in the United States and Canada, NPA hopes that rationing will not be necessary.

Six proposed new mills or mill additions, representing an estimated 250,000 annual tons and an investment of about $63,000,000, have been held up pending a previous decision handed down by a Defense Production Authority committee, which ruled newsprint to be non-essential. A finding of newsprint essentiality would not automatically give the go-ahead signal to construction, since firms would still have to apply for DPA certificates of necessity. Applications of tax benefits now pending include those of Bowater Paper Co., Inc., in eastern Tennessee, $39,725,000; Southland Paper Mills, Inc., Lufkin, Texas, $15,040,000; West Tacoma Newsprint Co., Steilacoom, Wash., $5,000,000; Great Northern Paper Co., Maine mills, $2,000,000; Michigan Paper Co., Plainwell, Mich., $1,500,000, and Crown Zellerbach Corp., West Lima, Ore., $214,000.

October Newsprint Production Reaches All-Time High

Total output of newsprint in North America during October was 588,648 tons, exceeding figures in any month on record, and total shipments were 591,035 tons. Production in Canada (including Newfoundland) was 492,475 tons with shipments of 497,410 tons. The United States output was 96,173 tons, with shipments amounting to 93,625 tons. Continental production and shipments for October last year were 547,748 and 558,032 tons, respectively.

The Canadian mills produced 217,969 tons more in the first ten months of 1951 than in the corresponding period last year, an increase of 5.0 per cent. The output in the United States was 76,809 tons or 9.1 per cent more than during this 10-month period in 1950. The total continental increase was 294,778 tons, or 5.6 per cent more than in the comparable period last year.

Stocks of newsprint paper at the end of October were 147,366 tons at Canadian mills, and 10,980 tons at United States mills, making a combined total of 158,346 tons compared with 160,733 tons on September 30, and 136,154 tons at the end of October 1950.

FAO Seeks Means of Boosting Newsprint

At a recent meeting in Rome, Italy, the Food and Agricultural Organization of the UN agreed to institute a worldwide search for some substitute for the pine tree as a source of newsprint. The group warned that the shortage of newsprint has become highly critical.

A three-step solution to the problem was offered during the meeting: (1) that the world's high-consuming nations use less newsprint than normally; (2) that the world's pulp producers increase production, and (3) that efforts be made to find adequate substitute raw materials for wood pulp production.

Mobile Paper Co. Added to RFC Probe

Two additional government agencies have entered the Mobile (Ala.) Paper Co. case, in which the former owner charges that he was forced from control of his own firm. The Senate permanent investigating committee, under the chairmanship of Sen. Clyde R. Hoey, and the FBI have begun studies of the charges. Previously, the Senate banking committee and the RFC's investigating group had probed the unusual history of the case. The Senate committee has secured from both the RFC and Senator Fulbright, chairman of the banking committee, the previous records and after an intensive preliminary study will probably hold public hearings. As usual, the FBI refuses to comment on its studies.

The investigation began when R. E. Hartman, former president of Mobile, a large producer of kraft papers, complained to Senator Fulbright that control of the company had been wrested from him "in a very interesting manner and that RFC and other officials were involved."

In 1948 Mr. Hartman secured the assistance of Rep. Frank W. Boykin of Alabama in securing an RFC loan. In order to secure the loan, Mr. Hartman claimed, he was forced to sell 40 per

cent of his ownership to what he called "Boykin interests." This was done through the efforts of a local RFC official. Mr. Hartman complained that Rep. Boykin told him that the loan of $600,000 would not be granted unless some outside capital was involved and that his son, later secretary-treasurer of the firm, and two others invested $250,000 to meet the requirement. It has been shown that the terms under which Mr. Hartman surrendered control were given in a telephone call to the local RFC official from Boykin's office.

The Mobile company had dealings with the RFC over a period of 16 years, borrowing a total of $1,657,000. When it started falling behind in payments in 1950, the RFC started foreclosure proceedings to liquidate the outstanding loan of $547,000. The property was sold to Stone Container Corp., with Mr. Boykin's son being retained in a managerial position.

Mr. Hartman has predicted that when further hearings are held by the Hoey committee more details will be disclosed. When the complaint was first made public, Rep. Boykin demanded that he be given a hearing by the Fulbright group, but that committee closed its hearings without taking the Alabama Congressman's testimony.

The Mobile case is only one of many in which questionable dealings with the RFC have come to light, but it may prove to be one of the most important. The FBI is not usually involved in cases of this type, and its inclusion in the probe has been looked upon as indicating that the investigation has more ramifications than have been made public.

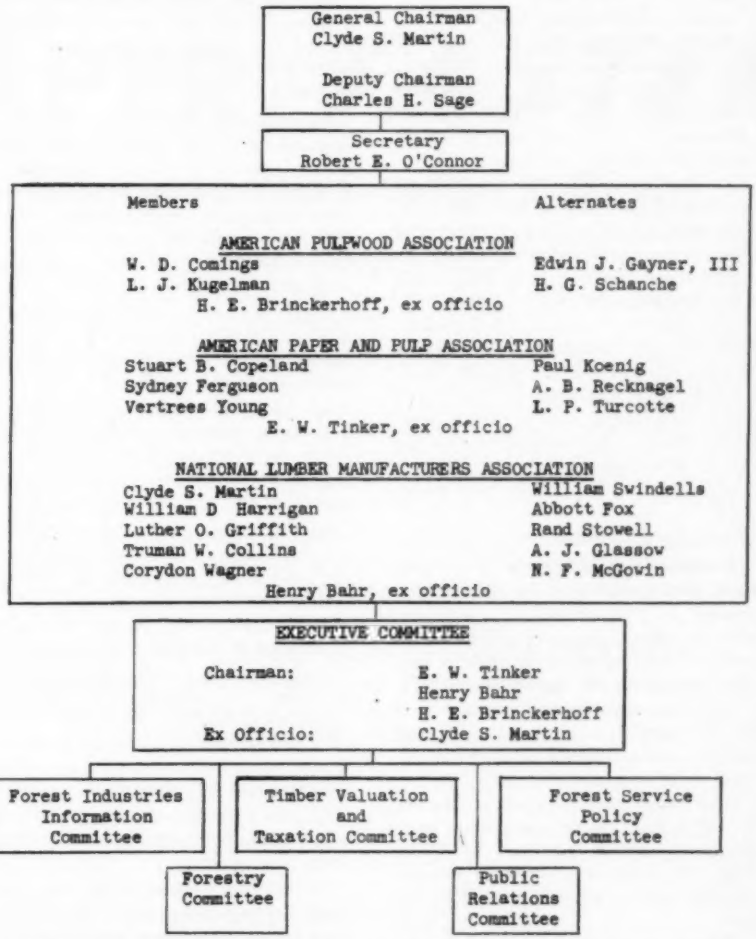
Mead Corp. Michigan Mill Sold to N.J. Newspaper

Mead Corp. has announced the sale of its Manistique, Mich., paper mill to the Trenton Times Corp., Trenton, N.J., for a reported $4,000,000. Mead will continue to operate the mill until early in 1952, when the new owner will gradually convert to newsprint production for export to South America. The mill has a daily output of 80 tons. No change in management or personnel is contemplated.

Until March of this year the mill was operated under the name of Manistique Pulp & Paper Co., and since then as a division of Mead. The enterprise was founded in 1916 to supply newsprint to the Minneapolis *Tribune*. Mead acquired the mill in 1943 and changed its operation to the manufacture of hanging raw stock for the wallpaper industry and other groundwood specialty papers. The mill employs 170 people.

Trenton Times Corp., publisher of the Trenton *Times* and the *Sunday Times-Advertiser*, hopes to alleviate the South American newsprint shortage through the purchase. The Manistique mill will supply 25,000 tons of newsprint annually to South America. Thomas L. Kerney, general manager of the Trenton Times Corp. and son of the founder, said that the Kerney family had long been interested in South American development.

Improvements at the mill since 1943 include: a new wood preparation department, a new fourdrinier section, the installation of diesel generating units, modernized screening equipment in the pulp mill and on the paper machine, a modernized finishing department, a large paper warehouse, and just recently a new wood yard layout has been completed to facilitate the delivery of truck and rail shipments.



ORGANIZATION CHART of the Forest Industries Council sponsored by the American Paper & Pulp Association, the National Lumber Manufacturers Association, and the American Pulpwood Association. Organized in 1943, the group coordinates the views and programs of the forest products industries. After consideration of problems and policies, action by the Council has been restricted to an occasional contact with departmental representatives in the government, the dissemination of information to the participating associations and to the membership of its committees

Mill Expansion Plans

Union Bag Expansion Progress Report

Modernization and expansion at Union Bag & Paper Corp., Savannah, Ga., has as its goal a daily paper and paperboard production of 1,750 tons by August 1953. This is an increase of nearly 30 per cent over the present daily rate of 1,350 tons.

This expansion project, known as "A" program, calls for the addition of a sixth paper machine, with a width of 236 inches and a speed of 2,000 feet per minute. The present machines are to be stepped up to 1,600 feet per minute, and the No. 2 machine is to be switched from kraft to semichemical hardwood nine point.

Included among the changes in pulp capacity necessary to meet machine re-

quirements is a new turbine which will bring the new 1,250 lbs. pressure boiler up to capacity. The installation will give Union Bag the largest high pressure boiler facility in the paper industry. Either coal or oil can be burned, with only 45 per cent of the fuel being purchased, since black liquor supplies 40 per cent and bark 15 per cent.

New Lime Kiln

A new Allis-Chalmers lime kiln with a daily pulp capacity of 800 tons was to be in operation in December. The kiln is 265 feet in length and 10½ feet in diameter.

Planned for the pulp mill is a new Goslin-Birmingham evaporator and a new Combustion Engineering chemical recovery unit, in addition to screen room equipment which includes washers and deckers and eight digesters.

The new semichemical pulp mill which supplies the No. 2 machine includes sulphur burners, liquor-making facilities, six digesters, nine Sprout Waldron refiners, two Swenson four-stage 9 by 16 foot washers, two Impco 8 by 16 deckers, and Impco screens. Plant engineers have estimated that one ton of semichemical pulp will be produced with 85 cubic feet of gum wood.

Wood Yard Changes

Extensive changes in the wood yard have been necessitated by the new increases in pulp capacity. Additional wood handling conveyors and a fluming system are to be installed, making possible the handling of both pine and hardwoods. One million cords per year will be the handling capacity when the new facilities are completed. The present annual capacity is 800,000 cords.

The hardwood operation is planned to add balance to the active forest management program practiced by Union Bag. The firm now owns or controls 750,000 acres within 100 miles of Savannah.

When the current expansion and modernization project is completed, Union Bag plans further increases, which will bring the total capacity to 2,000 tons per day. Included will be an additional 150 tons of kraft paper and board and 100 tons of semichemical nine point.

Senator Sees Need for Federal Aid in Mill Construction

Unless the newsprint industry is ruled "essential" by the government, Sen. Joseph C. O'Mahoney (Dem., Wyo.) believes that no new newsprint mills will be constructed in the foreseeable future. In summing up data from the Senate-House economic committee, which he heads, the senator said that "in a situation where all the newsprint that can be produced can be used, it is obvious that the only permanent solution must come through additional supplies of raw materials and an increase in capacity . . . The final step of being declared 'essential' is required."

Stockholders Approve Scott-Soundview Merger

Stockholders of Scott Paper Co. and Soundview Pulp Co., voting November 5 at meetings held simultaneously in Chester, Pa., and San Francisco, have approved the merger of Soundview into Scott. The merger became effective November 9.

Shortly after the voting Scott announced that U. M. Dickey, former president of Soundview, had been elected a Scott vice president. Mr. Dickey has been for several years a Scott director, and he will act as senior officer and representative of the Pennsylvania company board of directors in the western area.

Under the terms of the merger Soundview stockholders receive 1¼ common shares of Scott for each share of Soundview common.

In a statement following the merger, Thomas B. McCabe, president of Scott, noted that "for years Scott has been searching for an ideal paper mill site on the Pacific Coast . . . When the two large high-speed paper machines now under consideration for the Soundview site are ultimately brought into full operation, each will consume from 10 to 15 per cent of the present woodpulp production of Soundview, leaving the remainder for use in other Scott mills or for sale . . . Another very important asset contributed by Soundview is the extensive ownership of timber lands, together with other sources of timber, which should be sufficient to provide the pulp mill's present annual capacity of 200,000 tons with raw material for many years to come."

G. Willing Pepper, Scott vice president, has been designated to correlate its west coast operations with the company's headquarters. Paul C. Baldwin, former assistant general operating manager of Scott, has been elected assistant vice president and is being transferred to the west, where he will serve as president of Coos Bay Pulp Corp., a Scott subsidiary. L. S. Burdon, R. M. Buckley, and Henry Dennis, former officers of Soundview in charge of its operating divisions, have also been elected assistant vice presidents of Scott.

Scott also announced the election of Harrison F. Dunning, former general operating manager, as vice president; William M. Carney, controller, as vice president and controller, and R. W. Scott III, former secretary and treasurer, as vice president and treasurer. Andrew J. Schroder II was elected secretary and also continues as personnel director.

Courtaulds & Subsidiaries,
London, expects to have its first American operation in production by next fall. The large British rayon manufacturer plans production of staple rayon fibre from pulp at facilities located on a 650-acre site on the Mobile River 22 miles north of Point Clear, Ala. Costing approximately $7,000,000, the new plant will employ about 500 persons. An annual output of 50,000,000 pounds is estimated, increasing production of viscose rayon in the U.S. by 25 per cent.

St. Regis Paper Co.
has announced that shipment has been completed on the 228-inch Fourdrinier built under contract by Bagley & Sewall Co., Watertown, N.Y., for St. Regis' Pensacola, Fla., mill. The 4,000,000-pound machine required well over 100 railroad freight cars to transport. First shipments were begun in July.

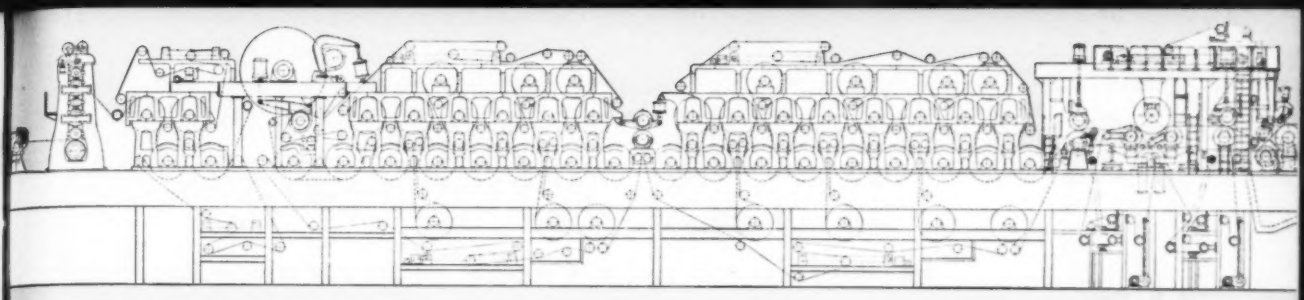
International Paper Co.
was to put its new pulp wood yard in Nashville, Ark., into operation in mid-November. The area is served by a rail spur that will transport pulp wood from the Nashville region. An office building is also to be constructed.

Hollingsworth & Whitney
had virtually completed its $7,000,000 expansion program at its Mobile, Ala., pulp and paper mill by November 6. Company officials said the plant's facilities for making pulp and paper have been increased by 75 per cent, and that its bleaching operations have been increased by 150 per cent. It is estimated that the expansion program will mean a $1,000,000 boost in the plant payroll.

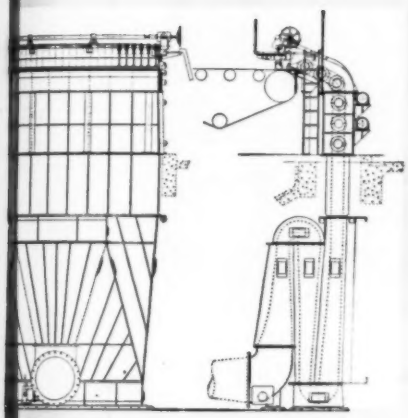
Monadnock Paper Mills, Inc.,
Bennington, N.Y., has signed a contract with the city commission of Elizabethton, Tenn., approving the construction of a $30,000,000 paper mill at Elizabethton. The paper firm has taken an option on a construction site on the Watauga River. Under terms of the contract, the mill would be financed by a $20,000,000 bond issue, and Monadnock would lease the facility for 22 years at $60,000 per year. A referendum on the bond issue was scheduled for November 15. The plant would manufacture wrapping paper.

Scott Paper Co.
expects to start construction in the near future of a proposed new paper mill at Everett, Wash. The project will cost about $17,000,000.

Allied Paper Bag Corp.,
Baltimore, Md., was to move during November from its 5,000-square-foot factory to a plant six times as large. The new building is within two miles of the firm's present location. Allied plans to



MORE PAPER, *FASTER*



because the Design is Right

Higher speeds . . . greater production . . . minimum shut-down time . . . easier handling and operating facilities . . .

The improvements built into your Puseyjones Machine make the big difference in production and profits.

Take wire changing, for example. With improved "Rapi-drape" Wire Handling, including Hydra-motor for raising and lowering the breast roll, there is minimum production loss. In recent designs, the "Rapi-Drape" device has been further improved by combining the breast roll, doctor and forming board into a single raising and lowering unit, thereby providing more slack in the wire and reducing the wire changing time.

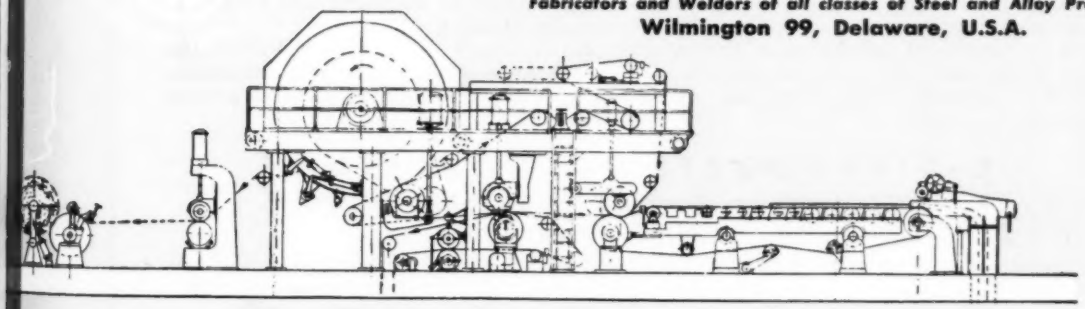
Whether your plans call for a completely new machine or the replacement of individual equipment, call in Puseyjones for the latest improvements in continuous, uniform, high-speed paper production.

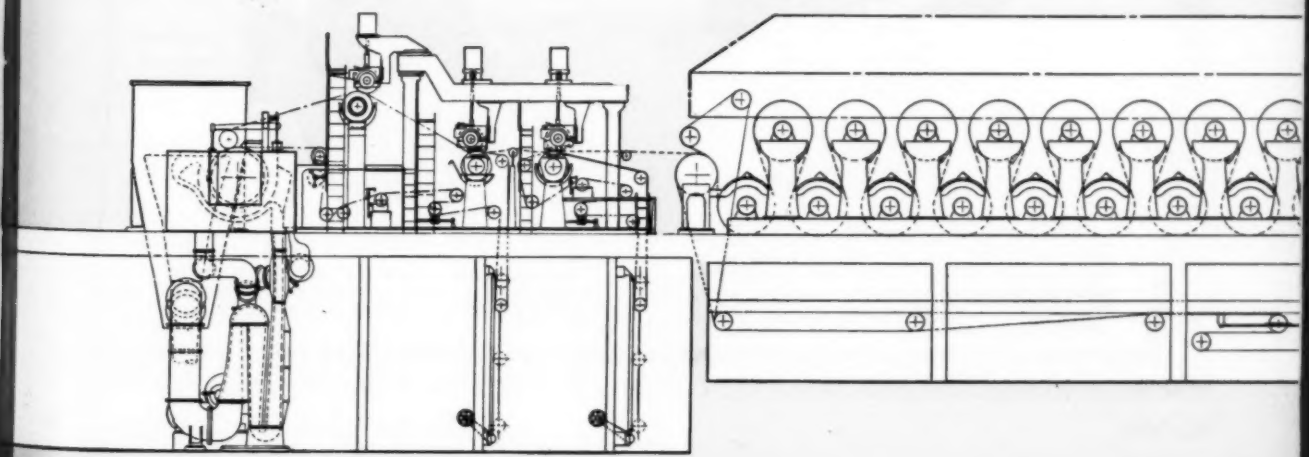
THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Fabricators and Welders of all classes of Steel and Alloy Products

Wilmington 99, Delaware, U.S.A.

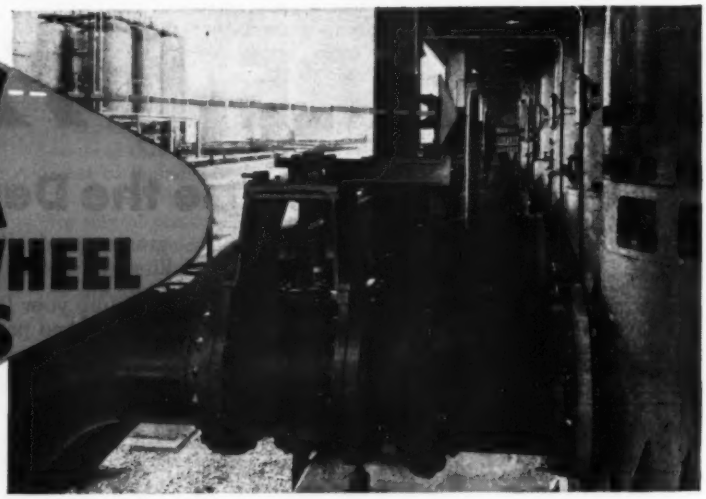




R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •

SIX HANDWHEEL TURNS



. . . Operate these R-S Valves

This installation of twenty-inch valves in the water system to one of the large oil refineries in Louisiana is another example of R-S time-saving efficiency. Such ease of operation is an important consideration in any pumping operation and especially where a battery of synchronous driven pumps discharges into a common header. Burned-out motors at start-ups can be practically eliminated.

Substantial savings in pumping power result due to the low pressure drop. The beveled vane ordinarily seated at a 12½° angle means greater control rangeability either manual or automatic and no down-time for cleaning.

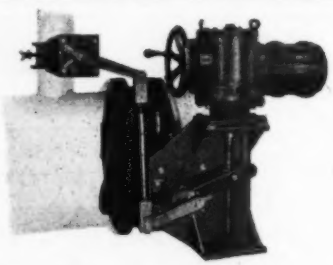
Install easily operated R-S Valves and obtain the most from your valve investment. Your local R-S representative is a valve expert—know him well.

R-S PRODUCTS CORPORATION

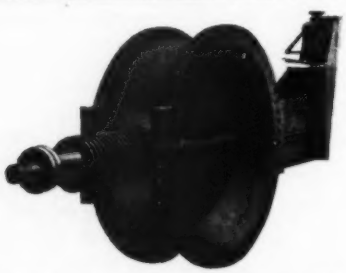
4600 Germantown Avenue, Philadelphia 44, Pa.

An S. Morgan Smith Company Subsidiary

REPRESENTATIVES IN PRINCIPAL CITIES



No. 798—Thirty-six inch and eight-inch R-S heavy duty valves of R-S "H" Metal at elevated temperatures for foundry cupola control. When the larger valve is wide open, the smaller valve is fully closed and vice versa. Slow operation is required, hence the motor operator with threaded reachrod.



No. 735—72-inch 125-pound "H" Metal R-S Valve for elevated temperatures. Valve is equipped with dual cooling fins. Oil cylinder and positioner utilizes 200 psig oil and 0-15 psig instrument air. Positioner cam driven simulating straight line semi-log control curve.

expand its output of glassine, cellophane, waxed, and other types of paper bags.

Hudson Pulp & Paper Corp.
has installed at its Palatka, Fla., mill two additional controlled flow beaters manufactured by Noble & Wood Machine Co., Hoosick Falls, N.Y. The new $10,000,000 Hudson mill has also included four Noble & Wood Unifiners and 19 propeller agitators.

Rayonier, Inc.,
has leased the entire 24th and 25th floors in the tower of the new 32-story Chrysler Building East in New York, N.Y. The firm will move its sales and executive offices to the new location about the first of the year.

Picco Logging Co.,
Montesano, Wash., expects to have its new chipper plant for the reduction of wood waste in operation by the first of the year. Chips will be supplied to Rayonier, Inc., at Hoquiam. Waste at the Picco mill approximates about 100,000 board feet per shift.

Eastern Corp.,
Bangor, Maine, during 1951 increased its truck fleet by purchases totalling about $100,000. Including trucks, tractor trucks, trailer vans, and oil tankers, the new modern equipment, together with previous purchases, represents an investment exceeding $250,000 for the intermill fleet, woods operating equipment, and vehicles for the transportation of pulpwood to the mills.

Burgess Cellulose Co.,
Freeport, Ill., was expected to complete alterations by November 1 on a factory building at Prairie du Chien, Wis., which the firm purchased recently. The Burgess company is moving its cellulose sponge manufacturing operations to the Wisconsin location. Main offices, however, will remain in Freeport.

National Container Corp.
has doubled the floor space at its Chicago corrugated box plant. A portion of the added area is to be used for inside storage, while the remainder will be used for manufacturing.

Midland Container Corp.,
St. Louis, has leased plant facilities containing 68,000 square feet from National Refrigerator Co.

Triangle Paper & Box Co.,
Chicago, has leased on a long-term basis an industrial building containing 90,000 square feet at 1501 S. Laflin St. Large scale remodeling is planned.

McLaurin-Jones Co.,
Brookfield, Mass., plans to construct a manufacturing unit for a new line of polyethylene-coated products on a 10-acre site near Homer, La. A complete line of gummed tapes will also be manufactured at the plant, and construction will allow for installation of equipment to produce both flat gummed and coated papers.

Plymouth Cordage Co.,
Plymouth, Mass., has announced a new paper twisting division which will market a line of products under the trade name PlymKraft. The line includes cable filler, tissue cords, paper-wrapped glass twines, chair seat cords, wool twines, weatherstripping, welting cords, seaming cords, cheese twines, and other specialties.

Envelope Mfg. Co.,
St. Louis, has opened a new addition measuring 50 by 73 feet and costing approximately $25,000.

Doniger Paper S. A. Corp.,
New York, N.Y., has been recently formed to operate specially as a sales agency for Arthur Doninger Paper Co., Inc., for the purpose of exclusive export to all countries of the Western Hemisphere.

Specialty Papers Co.,
Dallas, Texas, is a newly formed concern to distribute specially designed and custom manufactured coarse paper items to retailers in the area.

Continental Can Co., Inc.,
has broken ground for its multi-million dollar fibre drum plant at Pittsburg, Cal. The structure measures 350 by 640 feet and is expected to be completed by late spring. Five hundred persons will be employed.

Bodcaw Box Co.,
Stamps, Ark., has filed articles of incorporation with the secretary of state at Little Rock, listing authorized capital of $90,000. The incorporators are Alvis Fuller of Lewisville, and J. C. McMahen, A. L. White, and R. W. Drysdale, all of Stamps.

U. S. Paper Consumption Impresses Foreign Visitors

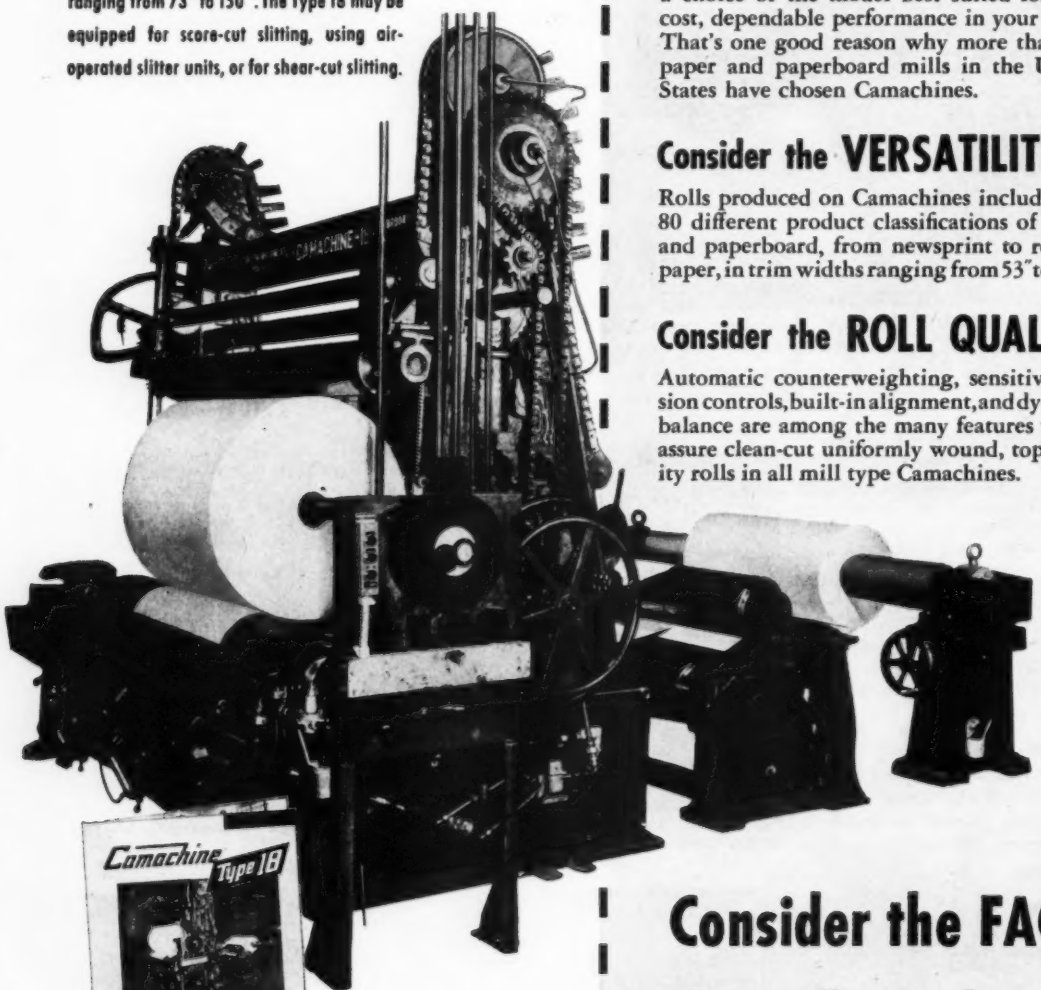
Conditions, attitudes and methods in the U.S. paper industry contrast sharply with those prevalent in Europe, according to a recent report released by 34 European pulp and paper experts who visited this country under the productivity and technical assistance program of the Economic Cooperation Administration. The visitors, from 12 Marshall Plan nations, published their findings in a 378-page report now being circulated to industry and government throughout Western Europe.

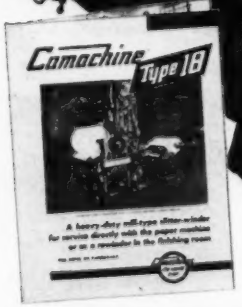
High spot among the many impressions received by the ECA team was the fact that the American consumer uses

IRISH VISITORS to U. S. paper manufacturers are shown as they toured American Writing Paper Corp., Holyoke, Mass. In the center of the first row is Richard T. Murphy, ECA project manager

DUTCH PACKAGING EXPERTS touring the U. S. under ECA auspices here visit Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich. To the extreme left is Preston D. Carter of KVP

Camachine Type 18 is one of the four great Camachine mill-type winders. The Type 18 is dynamically balanced to the maximum speed of 2500 fpm. The Type 18 may be built to your choice of 42", 60" or 72" maximum rewind diameter, for trim widths ranging from 73" to 150". The Type 18 may be equipped for score-cut slitting, using air-operated slitter units, or for shear-cut slitting.





Send for Bulletin 3010

CAMERON MACHINE COMPANY

61 Poplar Street, Brooklyn 2, New York

Consider the SPEED

The four great mill-type Camachines (Types 14, 18, 19 and 20) offer a choice of maximum speeds ranging from 1800 fpm on Type 14 to 5000 fpm on Type 20, depending upon characteristics of the material, number of cuts, web tension and machine width.

Consider the ECONOMY

Four great, job-proved mill winders offer you a choice of the model best suited for low-cost, dependable performance in your plant. That's one good reason why more than 400 paper and paperboard mills in the United States have chosen Camachines.

Consider the VERSATILITY

Rolls produced on Camachines include over 80 different product classifications of paper and paperboard, from newsprint to roofing paper, in trim widths ranging from 53" to 310".

Consider the ROLL QUALITY

Automatic counterweighting, sensitive tension controls, built-in alignment, and dynamic balance are among the many features which assure clean-cut uniformly wound, top-quality rolls in all mill type Camachines.

Consider the FACTS and you'll wind up with

Camachines®

about six times as much paper as the European. The scope of the American market, the natural resources and high purchasing power of the American people, according to the team report, offer American industry opportunities which are for the moment beyond the reach of Europe.

In this country to study modern methods for increasing production, the visitors pointed out that although productivity increases in the European paper industry would aid the economy, a severe shortage of raw materials hinders expansion. The surest way of aiding the industry in Europe, the experts felt, would be by a rational use of all resources and constant improvement in the technical and distribution fields.

U. S. Research Impressive

The team listed Ameriacn research as one of the areas in which the U.S. paper manufacturers outshine their European counterparts. They noted that research in this country had resulted in increased yield from raw materials by better preparation, the elimination of bottlenecks in mass production, and the increased recovery of useful materials from waste products.

The exchange of information within the trade in the U.S. has made possible great savings and important technical improvements. The visitors suggested that a similar exchange through a technical press for pulp and paper manufacturers would result in a corresponding benefit in European nations.

Also covered in the report are such subjects as standardization and specialization, trade barriers and market expansion, labor-management relations, trade associations, technique improvement, equipment investment, technological advance, standard of workmanship and material shortages.

Visit 14 States

While in the U.S. the ECA team visited manufacturers in 14 states and the District of Columbia. Among the firms on the itinerary were the following:

Bagley & Sewall Co., Watertown, N.Y.; St. Regis Paper Co., Deferiet, N.Y.; Carthage Machine Co., Carthage, N.Y.; Noble & Wood Machine Co., Hoosick Falls, N.Y.; Sandy Hill Iron & Brass Works, Hudson Falls, N.Y.; West Virginia Pulp & Paper Co., Mechanicville, N.Y.; Robert Gair Inc., American Paper and Pulp Assn., Lily Tuilp Cup Corp., Pulp Producers Assn., and the National Paper Trade Assn., New York, N.Y.

New York State College of Forestry, Syracuse; Bird Machine Co., South Walpole, Mass.; E. D. Jones & Sons' Co. and Eaton Paper Corp., Pittsfield, Mass.; Byron Weston, Dalton, Mass.; Hurlbut Paper Co., South Lee, Mass.; Strathmore Paper Co., West Springfield, Mass.; Sorg Paper Co., Middletown, Ohio; Cincinnati Milling Machine Co., Cincinnati; Tremco Mfg. Co. and Great Lakes Box Co., Cleveland; Swenson Evaporator Co., Harvey, Ill., and Northern Regional Agricultural Research Laboratory, Peoria, Ill.

National Aluminate Corp., National Paper Board Assn., Celotex Corp., Container Corp. of America, Atlas Box Makers and Folding Paper Box Assn. of America, Chicago; Alton Boxboard Co., Alton, Ill.; Beloit Iron Works, Beloit, Wis.; Thilmany Pulp & Paper Co., Kaukauna, Wis.; Institute of Paper Chemistry, Fox River Paper Co. and Appleton Machine Co., Appleton, Wis.; Bergstrom Paper Co., Neenah Paper Co. and Kimberly-Clark Corp., Neenah, Wis.; Wisconsin Tissue Co., Gilbert Paper Co. and Marathon Corp., Menasha, Wis., and Rhinelander Paper Co., Rhinelander, Wis.

Consolidated Water Power & Paper Co., Wisconsin Rapids; Hoberg Paper Mills and Green Bay Pulp & Paper Co., Green Bay; Forest Products Laboratory, Madison, Wis.; Downingtown Paper Co. and E. Austin Bicking Paper, Downingtown, Pa.; Lukens Steel Co., Coatesville, Pa.; Ruberoid Co., W. C. Hamilton & Sons and Whiting-Patterson Co., Philadelphia; Hercules Powder Co. and Scott Paper Co., Wilmington, Del.; American Cyanamid Co., Stamford, Conn.; International Paper, Georgetown, S.C.; Sonoco Products Co., Hartsville, S.C., and Union Bag & Paper Corp. and Herty Foundation Laboratory, Savannah, Ga.

Southern Paper Board Co., Port Wentworth, Ga.; Rayonier Inc., Fernandina, Fla.; National Container Corp. and Knight Bros. Paper Co., Jacksonville; Weyerhaeuser Timber Co. and Longview Fibre Co., Longview, Wash.; Columbia River Paper Mills, Vancouver, Wash.; Crown Zellerbach Corp., Camas, Wash.; U.S. Government Printing Office, National Bureau of Standards, National Planning Assn., Department of Commerce and Department of Labor, Washington, D.C., and Clifton Paper Box Co., Clifton, N.J.

American Can Co., Jersey City; Hinde & Dauch Paper Co. and Alco-Gravure Co., Hoboken, N.J.; Samuel M. Langston Co., Camden, N.J.; Gibraltar Paper Co., North Bergen, N.J.; St. Joe Paper Co., Hackensack, N.J., and Ball Bros. Co., Noblesville, Ind.

Decision Expected in Ga. Clay Patent Trial

Decision is expected in several weeks in the Brunswick, Ga., suit in which the George Kaolin Co. of Dry Branch, charges Thiele Kaolin Co. of Sandersville with patent infringement involving treatment of Georgia clay for use in high grade paper. The suit was filed in September 1949.

The alleged infringement involves a patent issued in 1939 to William T. Maloney. The patent covers a process for treating the clay to improve its qualities and make it suitable for use in coating processes. The suit asked an injunction to restrain use of the process by the Sandersville firm. Evidence was taken in Georgia, Michigan, Wisconsin, New York, and Great Britain.

Beetle Damage in South Continues High

Widespread killing of valuable pine trees by bark beetles continued in 1951 in the South, according to U.S. Department of Agriculture entomologists. They estimate that more than 50,000,000 board feet of lumber were ruined during the summer months. The southern pine beetle caused the greatest damage. Other insects plaguing the area included the black turpentine beetle and species of pine engraver beetles.

The southern pine beetles were especially troublesome in portions of east Texas and eastern North Carolina. The black turpentine beetle caused damage in North Carolina, Florida, Mississippi, and Louisiana, while the pine engraver beetle caused damage throughout the South.

Further Drop in Waste Paper Prices

Waste paper prices fell sharply during November. Trade sources said that the drop reflected the decline in demand in recent months. Weakness was said to be most evident in paperboard and higher grades of waste papers used extensively as a raw material in new container and packaging production. The easing in demand for waste paper used as a substitute for pulp, which began during late summer, continued.

Industry spokesmen said, however, that the basic tightness in the world pulp supply will bring a revival in demand by early spring. Prices of lower grades of waste paper are down to $10 to $15 a ton, compared to the July high of $30. In the higher grades, hard white envelope cuttings are off as much as $30.

Bags Containing Benzene Hexachloride Rejected

Multi-wall bags manufactured for benzene hexachloride are being rejected as waste paper by several paperboard mills, according to the weekly bulletin published by the Midwest Consumers of Waste Paper. These used bags are unusable in any grades of waste paper, since the insecticide they contained when new would cause the finished paperboard to retain a strong odor rendering it unfit for use.

Benzene hexachloride (BHC) is an insecticide used against agricultural insects. Its odor is similar to that of rotting wood. It is manufactured under such trade names as Gantox, Isotox, Hexadow, Hexone, Geigy Lindane, Gam-Kil, Powco BHC, Lindano, and Trivex.

AFPI Report Shows 3,372 United States Tree Farms

The most recent tree farm report issued by the American Forest Products Industries, Inc., Washington, D.C.,

shows a total of 3,372 farms in the U.S. The acreage involved amounts to 23,945,251, compared to 23,702,793 in October.

Texas leads in acreage with 3,082,940. Other states with substantial acreage include: Arkansas, 3,009,843; Washington, 2,843,534; Oregon, 2,377,705; Alabama, 2,360,692; Florida, 1,739,991, and South Carolina, 1,022,319.

Regional totals are as follows: South, 14,560,641 acres; West, 7,637,438; Lake States, 1,247,719; East, 349,379; Central, 112,940, and Plains States, 37,134.

Maine U. Announces Remaining Pulp Technology Schedule

The Chemical Engineering Department of the University of Maine, Orono, has announced the remaining schedule of industrial speakers in its pulp technology course. This series of lectures, arranged by Profs. Lyle C. Jenness and John Lewis, marks the fourth year in which the speakers have been representatives of industry.

Lecturers, together with their respective topics, who will appear in the coming weeks, are as follows:

December 11—T. J. Carlin, Brown Co., Berlin, N.H., "Sulphate Pulping"; December 18—J. H. Coulter Jr., Babcock & Wilcox Co., Boston, "Soda and Sulphate Recovery"; January 8—Robert L. McEwen, Buffalo Electro-Chemical Co., Buffalo, N.Y., "Peroxide Bleaching," and January 15—John C. Cousins, Penobscot Chemical Fibre Co., Great Works, Maine, "Chlorine Bleaching."

Canadian Developments Keep Pace With Paper Industry Expansion

Expansion and modernization programs in the Canadian paper industry are keeping pace with the growing demand for paper throughout the world. Numerous firms have announced building programs during the past several months, most of them in the newsprint production field, while many companies are planning development of log-hauling facilities in an effort to reach vast timber resources in the interior.

Celanese Considering Expansion to Integrate Facilities

Celanese Corp. of America is reported to be considering a multi-million dollar expansion program which will completely integrate its Canadian facilities. Columbia Cellulose Ltd., the firm's Canadian affiliate, recently opened a $27,000,000 alpha pulp mill near Prince Rupert, B.C. The new expansion is said to include a newsprint mill, high alpha pulp plant, sawmill, and other wood-consuming industries in the Arrow Lakes region of southeastern British Columbia.

Textile Industry Possible

Vancouver industrialists are hoping that the manufacture of textile fibres in the Celanese subsidiary plant at Edmonton will mean the establishment of a large textile industry in the region. High alpha cellulose produced at the Columbia Cellulose plant in Prince Rupert is to be taken by rail to the Edmonton plant, operated by Canadian Chemicals Ltd., where it will be converted into chemicals, staple fibre or filament yarn. The natural gas of the region is to be utilized in the production.

Forest Products Firm Established

Formation of Celgar Development Co. has been taken to indicate that Celanese is interested in establishing an extensive forest products industry in the West Kootenay District of British Columbia. The new company has applied for a foreshore lease involving 270 acres on the south shore of the Columbia River, according to reports. Extensive surveys have been reported from that area recently, and these may well be the first signs of Celanese activities. The site involved was owned by William Waldie & Sons of Castelgar and includes the area occupied by the Wesley lumber operations some years ago.

Logs Being Hauled From Cariboo

Kelley Logging Co. Ltd., a subsidiary of Powell River Co., has assigned 58 log-carrying railway cars to the Cariboo. They will haul jack pine and spruce logs over the Pacific Great Eastern Railroad from Williams Lake and Quesnel to Squamish. Here the logs are to be put into booms and towed to Powell River for conversion into newsprint and pulp. It is hoped that about seven cars, each carrying 8,000 f.b.m., will make the trip daily.

New Company to Produce Packaging Materials

TCF of Canada Ltd., a newly formed company that will manufacture transparent cellulose film and other packaging materials, has started construction of a new plant at Cornwall, Ont. Completion is scheduled for the spring of 1953. Initial annual production is expected to be about 7,000,000 pounds.

The firm is associated with British Cellophane Ltd. of Great Britain, one of the major stockholders. The parent company is the principal producer and largest exporter of transparent cellulose in the British Commonwealth. Major stockholders are to be Courtaulds Ltd. and Courtaulds (Canada) Ltd.

Brompton to Increase Red Rock Capacity

Brompton Pulp & Paper Co., Montreal, recently announced a $15,000,000 expansion program at Red Rock, Ont. Under existing conditions, the additional production will be available during 1954. Capacity will be increased to 150,000 tons of kraft board and 60,000 tons of newsprint annually. Present capacity is 80,000 tons of kraft board and 20,000 tons of surplus pulps.

The expansion will be effected by installation of a high-speed modern kraft paper machine, an increase in kraft pulp capacity, and conversion of the existing kraft paper machine to the manufacture of newsprint. The program also embraces housing facilities to accommodate the additional employees.

The company has slated completion of its $7,000,000 modernization at East Angus, Que., for the end of 1953. This expansion includes an increase in capacity for manufacturing kraft paper products.

Princess and Duke Tour Kapuskasing Mill

Princess Elizabeth and the Duke of Edinburgh toured the Kapuskasing, Ont., mill of Spruce Falls Power & Paper Co. Ltd. while on their cross-Canada tour. Mayor A. M. Stevenson, a mill foreman, served as guide and host at an informal party held in connection with the royal visit. An estimated 7,000 persons flooded the little town to glimpse the famed pair.

British Columbia Leading in Forestry Integration Drive

British Columbia is leading in its drive for forestry integration in Canada. According to A. K. Cameron, a director of St. Lawrence Paper Corp., governments will tend more and more to restrict timber leases to operations which will install fully integrated operations. In his opinion, the next 10 or 15 years will prove this.

This fact has led to concern in British Columbia from smaller operators who do not feel that they will be able to integrate or will never be large enough to be able to afford a management license. However, E. T. Kenney, Minister of Lands and Forests for B.C., has repeatedly assured smaller operators that the government intends to maintain public working circles from which they will be able to draw their supplies in perpetuity. So far, however, no actual reserves have

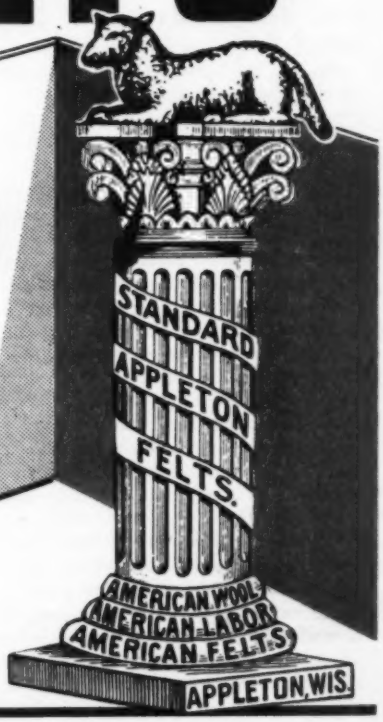
for UNIFORMITY

for DEPENDABILITY

APPLETON FELTS

for SERVICE

for DESIGN and FINISH



APPLETON WOOLEN MILLS
APPLETON • WISCONSIN

been set aside for public working circles.

Some steps have already been taken in establishing an allowable cut program in three of the most heavily cut forest areas in the lower mainland of the province.

Forest Management Legislation in British Columbia will be discussed at the January meeting of truck loggers operating in the Province. The gathering is to be held at Vancouver. A spokesman for the group has reported that it is felt that the present set-up does not give enough scope and guarantee for the future. Establishment of a forest board will be sought, as was suggested in the Sloan Report of six years ago.

Six Species of Pulpwood Trees are depicted in an art display which is touring Canada under the auspices of the Canadian pulp and paper industry. The forest landscapes, all painted by dominion artists, are done in oil on 30 by 40 inch canvases. The species shown are spruce, jack pine, poplar, hemlock, balsam, and western hemlock.

Veneer Production is Reported planned in the Prince Rupert section of British Columbia. Industry spokesmen in the region have indicated that J. K. Hart of Everett, Wash., is interested in the project.

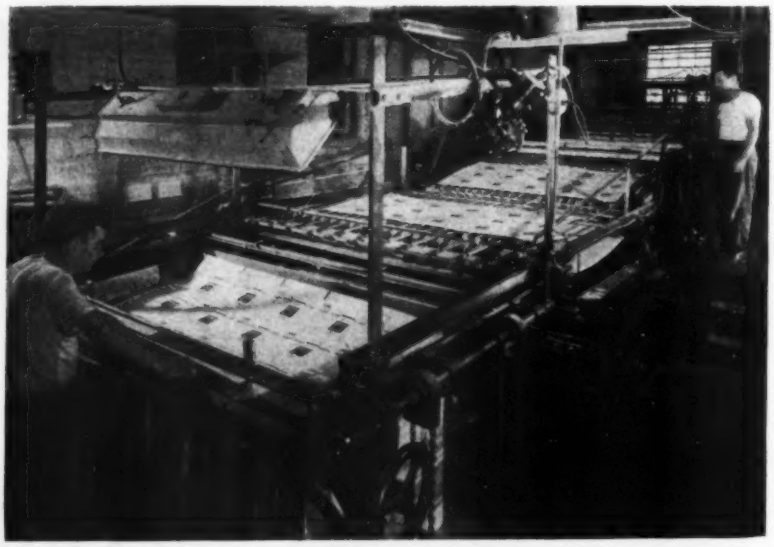
Dixie Cup Co. (Canada) Ltd. will add 33,600 square feet to its plant at Brampton, Ont., increasing total space to 93,600 square feet. Work, started in the fall, is scheduled for completion by spring.

Latin America May Export Pulp

Mexico and other Latin American countries may eventually become pulp exporters, Dr. Robert S. Aries, New York, N.Y., consulting engineer, told members of the Association of Consulting Chemists and Chemical Engineers at their recent annual meeting in New York. The speaker pointed out that a study of 2,500,000 acres of forest area in Mexico had shown a potential production capacity of several thousand tons a day in cellulose products. The growing Mexican rayon industries, which now import their pulp, can also be expected someday to become self-sufficient.

The cost of wood in Mexico, delivered at the plant and processed by local labor, is about one-tenth the equivalent cost of operation at a typical U.S. pulp and paper mill. However, despite recent activity in the Mexican pulp industry, that country still imports considerable cellulose products. Pulp and paper industry spokesmen in Mexico have forecast an expanded output of first-grade pulp, paper, and wallboard from cellulose available from Cuban sugar cane plantations.

MODERN CONVERTING PLANT of Interstate Folding Box Co. at Middletown, Ohio. The site was acquired in 1918 after the firm's first building had been destroyed in the 1913 flood, its second razed by fire. In addition to this installation, the company maintains another Miami Valley plant at Miamisburg for the production of boxboard. Floor space at Middletown is 30 times that of the original building



COLOR AND REGISTER being checked at one of a battery of automatically fed, high-speed presses, which daily turn out thousands of printed boxes at Interstate. Printers and pressmen charged with the production of multi-color printing on folding paperboard are skilled operators with broad technical and practical knowledge of their craft

Constant Pioneering Key to Interstate's Development

Interstate Folding Box Co., with plants in Middletown and Miamisburg, Ohio, is observing its 40th year of continuous operation. Founded in 1911 by Samuel Bergstein, the firm's steady growth has been linked with the constant development of new processes and products.

An important factor in Interstate's success is that much of the machinery and equipment now in use was developed and built in the company shops. Among brand names made famous by the firm have been the Cel-o-Fold packages for protecting and dispensing meats and other frozen specialties, and the Foldomatic and Frostofold frozen food packaging materials. Interstate has contributed more than 170 patents and countless improvements to the techniques of better packaging. It now maintains sales offices and representatives in 23 cities.

Also a pioneer in employee relations, Interstate began an industrial group life insurance policy for its workers in 1928

—one of the first in the United States. Current president of the company is Robert Bergstein, son of the founder.

Paper Demand up in Colombia

Demand for paper and paper products in Colombia is increasing rapidly, both as the result of population increases and because the people are constantly being introduced to new uses for paper. This view was expressed recently by Alberto Lotero, manager of Alotero, a paper firm in Manizales, as he spoke at a reception held in New York, N.Y., by Transportadora Grancolombiana. He indicated that the increased demand may continue for many years to come.

Demand is higher than ever before for such products as bags, adding machine tape, gummed paper, paper napkins, and facial tissues. New government regulations on sanitation have boosted the demand for paper as food wrapping. Mr. Lotero and other Colombian business and industrial leaders have been touring the United States in the interest of promoting closer trade relations.

Proposed Sulphur Limitations Attacked by Chemical Industry

Limitations on the use of sulphur and sulphuric acid proposed recently by the National Production Authority are meeting stiff opposition by representatives of the chemical industry. Complaints were heard that the industry advisory committee was not consulted before the NPA proposed action was ordered. A committee member declared the move to limit some uses of sulphur and not others unfair. The proposed program limits the use of sulphur for the production of sulphuric acid and carbon bisulphide to 90 per cent of the 1950 rate, excepting sulphuric acid output for essential programs.

Shortage to Continue

Despite new deposits recently found on the Gulf Coast, the sulphur shortage promises to continue at least through 1952. According to figures released by the sulphur committee of the International Materials Conference meeting in Washington, D.C., the "free" world demand for both crude and refined sulphur will total 7,134,200 long tons this year, while production is expected to total only 5,862,300. Next year demand is expected to mount to 7,596,300 tons, compared with production of only 6,255,600.

Production of pyrites, a principal source of sulphur, is expected to fall short of the world's needs by 56,100 tons this year and 254,800 next year.

Export Quotas Established

Export quotas of 240,000 long tons of crude sulphur and 7,500 long tons of refined sulphur have been established for the fourth quarter of 1951 by the Office of International Trade, U.S. Department of Commerce. Combined, the two quotas represent approximately 18 per cent of the current estimated rate of U.S. production. This latest allocation makes the total 1951 export quota 1,000,000 tons. This is 11 per cent below 1950 exports.

Inventories Limited to 25-Days' Supply

In an order issued November 9, NPA ruled that users must limit their sulphur inventories to 25 days or a "practicable working minimum," whichever is less. NPA took the action by amending M-69, the basic sulphur order, which limits users to 100 per cent of their 1950 rate of consumption. The move was made by the government agency after protests from industry representatives.

It was explained that while inventories in the hands of all users average 38 to 40 days, in individual cases they vary from five to 90 days or more. As a result of the 25-day inventory limitations, consumers with excess stocks will have to cancel orders already placed. Demand for sulphur is currently running about 10 per cent ahead of supply.

Pulp Industry in Northwest Periled by Shortage

Lack of sulphur is periling the pulp industry in the Northwest, according to a recent survey. The situation had its beginnings early this year when sulphur suppliers notified the industry they would cut down to 80 per cent on contract provisions and on contract renewals.

The move struck the industry at a time when mills were planning increases in production and seeking more rather than less sulphur. The cuts in supplies of the chemical were brought about as a result of government allocations to foreign industries. Subsequently, the International Control Committee, deriving its power from defense legislation passed by Congress, announced its plan as to how American production was to be divided among foreign consumers.

The industry promptly resorted to economies that resulted in some sulphur saving. Inventories had to be reduced, while new sources were being rapidly developed. In some instances where pulp producers could show actual distress NPA made special dispensations to maintain reasonable supplies.

Because of the fact that recent discoveries of new sulphur fields in Texas, Louisiana, and Mexico offer no immediate relief from the shortage—and may, in fact, provide no long-range relief since consumption over the world is increasing correspondingly, some of the larger pulp producing mills in the Northwest are exploring possible new sources. The industry is now looking hopefully toward the process by which sulphur can be produced from natural gas as a possible answer to additional supplies of sulphur needed for capacity operations and expansion.

U. S. Developments

Three Pacific Coast pulp and paper companies plan to obtain scarce sulphur by building a $1,314,000 plant near Powell, Wyo., to recover the element from oil field gases. Partners in the venture are Rayonier, Inc., Crown Zellerbach Corp., and Soundview Pulp Co. The group has been granted a Defense Production Administration certificate under which 8 per cent of the plant's cost may be written off in depreciation for tax purposes in five years. Under present plans, the production would be about 100 long tons a day.

Black Rock Desert Mineral Co., San Francisco, has reopened the Black Rock sulphur property 60 miles northwest of Winnemucca, Nev. A second unit is being installed so that daily production will eventually reach 40 tons.

Canada

The sulphur shortage has directed interest to the ore on Pilley's Island (Newfoundland). The sulphur content of the copper ore—estimated at approximately 40 per cent—will be exploited. It is reported that a new company, Pilley's Island Copper (1951) Ltd., will be formed to undertake the project, and that two mining companies will furnish the capital.

France

The reconstructed sulphuric acid plant of Union Francaise in the La Rochelle-Pallice area was opened in July. It has a daily capacity of 40 metric tons and is reported to be one of the most modern factories in Europe. The plant was destroyed in 1944.

Customs Court Cases

Three different problems are involved in the importation of kraft paper impregnated with phenol resins produced in Canada, according to a report issued by Warren B. Bullock, manager of the Import Committee of the American Paper Industry. One involves the dutiabil-

ity of a laminated product, another a solid sheet, both of which are claimed by importers to be dutiable at the rate for paperboards. In addition, the imports of the laminated material are already under investigation in the belief of customs officials that the merchandise was undervalued. The same condition may exist in the case of solid sheet.

Four shipments of Finnish wrapping paper have been held by New York Customs officials to have been undervalued, and three shipments of paper through New Orleans for a Tampa newspaper were denied duty-free entry as standard newsprint and held to be dutiable as printing paper because of a content of over 30 per cent chemical pulp. Importers of 10 shipments of Finnish wrapping paper have dropped their protest against a finding of undervaluation by Customs officials.

Several shipments of gypsum lath and wallboard from Eire and the United Kingdom have been classified for duty at the rate for processed paperboard and not at the lower rate for wallboard, as claimed by the importer. These shipments were principally for markets in the Southern Atlantic states.

Government Actions Affect Paper Industry

Leading the list of federal regulations affecting the pulp and paper industry during the past month was the OPS action setting dollars-and-cents ceilings for manufacturers on 53 specified grades of writing and other fine papers. The agency also prescribed means of determining ceilings on other grades. The ceilings, stipulated in CPR 91, are to continue "the same general average level" of prices as under the January 26 freeze. Certain disparities frozen into the price structure under GCPR will be remedied. The spelled out base prices apply to specific grades and their related grades and, by application of spelled out differentials, to grades which vary in tint, color, finish, and other particulars.

NPA Announces Allotments for Paper Machinery Manufacturers

During the first quarter of 1952 pulp and paper machinery manufacturers will receive material allotments of at least 75 per cent of those of the fourth quarter, 1951. This was announced by an NPA spokesman. The industry has reported that the fourth quarter allotments permitted operation at only about 50 per cent of total capacity.

First quarter allotments are to be as follows: stainless steel, 54 per cent of fourth quarter; carbon steel, 75 per cent; alloy steel, 96 per cent; brass mill products, 85 per cent; wire mill products, 72 per cent; foundry products, 82 per cent, and aluminum, 82 per cent.

Strattner Receives NPA Appointment

Lawrence W. Strattner, administrative vice president of West Virginia Pulp & Paper Co., has been appointed deputy assistant administrator of the Chemical, Rubber and Forest Products Bureau, NPA. He succeeds Gabriel J. Ticoulat, who was recently appointed a DPA deputy administrator for international problems.

Industry Advisory Committees

Members of the Coated and Processed Paper Industry Advisory Committee have met with OPS officials to check in detail provisions of a proposed tailored regulation for their industry under which they would price by formula. It was suggested that manufacturers use formulas in effect during the base period of January 25 to February 24, 1951, and employ the same margins used during this period.

The effect on their industry of CPR 88, covering unbleached kraft paper, was discussed with OPS officials recently by members of a subcommittee of the Paper Shipping Sack IAC. Committee members protested that proposed tailored regulations for the industry would tend to increase material costs.

Power Plant Construction in Northwest Deferred

Plans for construction of several steam power plants in the Pacific Northwest by the Interior Department have been shelved temporarily by the House of Representatives rules committee.

RFC Loans for New Newsprint Mills

Senator Hill (Dem., Ala.) has introduced a companion bill to the House measure providing for RFC loans for the encouragement of new newsprint production facilities. The bill states that it is the policy of Congress to facilitate construction of domestic plants, and that loans could be made for as much as 50 per cent of the cost of construction.

OPS Ceilings

OPS has corrected inadvertent errors in CPR 84, which covers certain converted paperboard products. The correction specifies that bobbins, cans, canisters, cones, cores, ribbon blocks, roving cans, spindles, spools, tubes, cylindrical paperboard casings and cans, and related hollow paperboard and paper commodities, partially or completely manufactured on an open-end rotating or stationary mandrel, are covered by the regulation. Other corrections specified what transactions in the base period are to be employed for comparison purposes in establishing new ceiling prices.

Pulp and Paper World Report

Mill construction and expansion throughout the world, together with government actions designed to ease the pulp and paper shortage, have played a major role in foreign economies in recent months. United States aid in the world picture was furthered early in December by an announcement of fourth quarter woodpulp export quotas by the Office of International Trade, U. S. Department of Commerce. The quota for dissolving and special chemical grades of woodpulp is 7,000 short tons and for unbleached sulphate 25,000 short tons. For bleached and unbleached sulphite (paper grades) and bleached and semi-bleached sulphate the fourth quarter export quota is 7,000 short tons.

Mexican Developments

Final equipment for a new paper machine being built at Monterey was to be delivered before the end of the year by Sandy Hill Iron & Brass Works, Inc., Hudson Falls, N.Y. The new mill, being built by Productora de Papel S.A., is designed for two paper machines. It is expected that the first machine will be ready for production sometime in the spring, producing kraft paper for bags of all kinds. The machine will have a minimum daily capacity of 30 tons. A new power plant has been constructed as a part of the expansion plan with the economic aid of National Financiera S.A.

Two government resolutions effective until December 31 provide that a subsidy equal to 75 per cent of Mexican import duties may be granted to importers of the following products: Manila cardboard; mechanical woodpulp in undyed sheets, with perforations no more than 15 centimeters apart, for the manufacture of paper; cellulose pulp in undyed sheets; cellulose pulp pressed in blocks, weighing more than 1 kilogram

Take the guesswork out of caliper control

Don't depend on your machine tender to watch for caliper fluctuations. It's too risky . . . and expensive. After all, he's only human . . . and he's got other duties.

Put a Hurletron Caliper and Weight Control to work for you and it stays on the job every minute . . . never loafs . . . never takes time out for a smoke or a sandwich. Three ultra-sensitive gauging heads (not one, but three) measure the thickness of every inch of the sheet at the wet end . . . record the measurements . . . and make corrections . . . automatically. As a result, your Hurletron equipment will maintain a density of plus or minus 1½% through a caliper range of 5 to 150 points.

And you know what that means . . . a higher quality finished product . . . a tremendous saving in stock . . . a worthwhile reduction in waste . . . a tremendous saving in operator's time. And of course, costs are cut to the bone.

And . . . remember . . . the Hurletron Caliper and Weight Control provides all these advantages automatically:

- **Holds wet end fluctuations to plus or minus one point**
- **Measures thickness at 40″ intervals clear across the sheet**
- **Makes corrections by regulating flow of stock *but only when a trend has been established***
- **Provides a continuous, permanent record of wet end caliper**
- **Signals operator when a drift across the sheet is indicated**
- **Provides a continuous reading and record at the dry end**

The Hurletron Automatic Caliper and Weight Control has demonstrated its value as a time and money saver in leading mills all over the country. We'll be glad to show you how it can do the same for you. Just write, wire or phone . . . there's no obligation.

Write for this bulletin
Our Bulletin No. 211 contains full details about the Hurletron Control together with photos, charts and diagrams. Ask for your copy today.

HURLETRON *Automatic* CALIPER and WEIGHT CONTROL

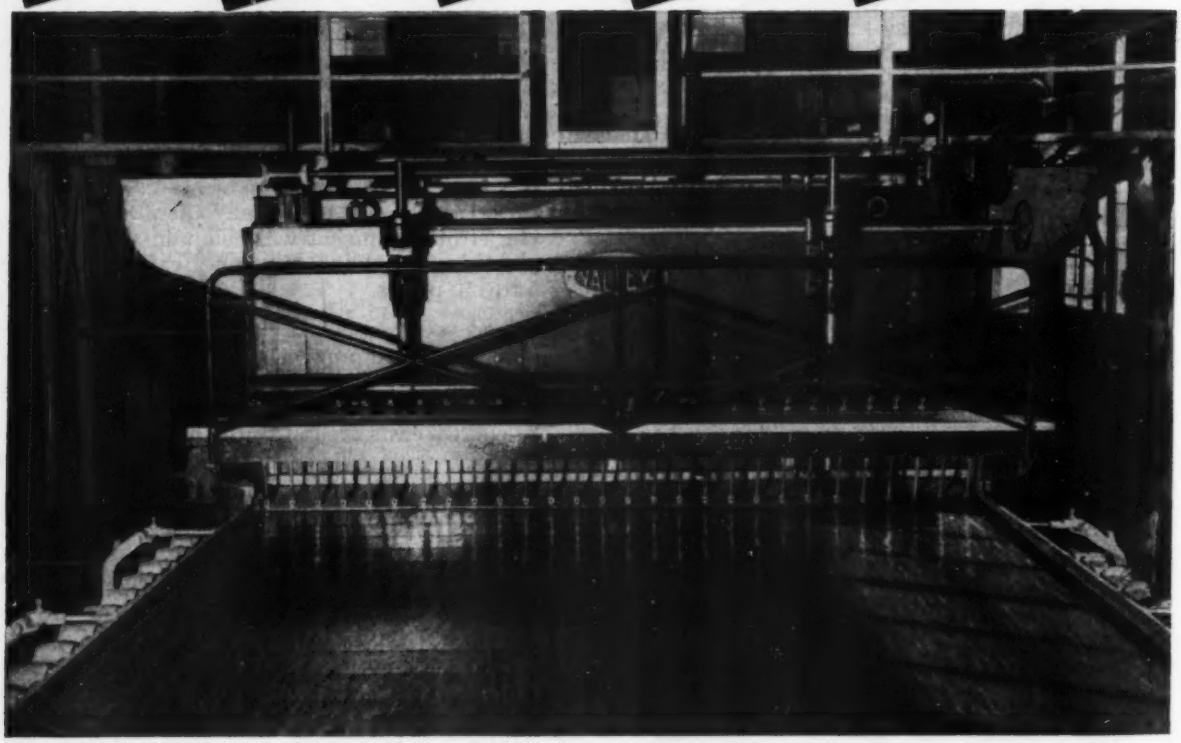
ELECTRIC EYE EQUIPMENT COMPANY

10 WEST FAIRCHILD STREET, DANVILLE, ILLINOIS

Another New Papermachine

WITH INLET AND HEADBOX BY VALLEY

FORMATION **CALIPER** **LEVEL SHEET** **INCREASED SPEED** **HIGHER TEST**



Fully Half of our substantial backlog of Valley Stock Entrance Equipment is for new papermachines

***NOTE TO TOP MANAGEMENT:** When buying a new papermachine, it will pay you to investigate . . .

Inlet and Headbox by VALLEY

VALLEY IRON WORKS CO., Appleton, Wisconsin

per square meter, and even containing up to 25 per cent mineral material; cellulose bleached with sulphite; paper waste and clippings; cordage in small pieces for the manufacture of paper, and rags of vegetable fibres in small pieces for the manufacture of paper.

The government has established a total prohibition of logging or wood cutting in the states of Guanajuato, Colima, and Nayarit in the northern territory of lower California. This raises to 22 the number of states, including the Federal District, where such bans have been ordered.

Cuba

Plans have been discussed for the establishment of a plant to produce newsprint from sugar cane bagasse. It has been reported that newsprint manufactured by this method is as good as the product currently in use in the United States and that the financing of factory construction has been agreed upon. The cost of such construction is expected to be between $10,000,000 and $15,000,000.

United Kingdom

For the first time since World War II the rate of paper production is equal to that of prewar. The rate of board production, at 39 per cent above prewar, equals the record postwar rate achieved in June of last year. Newsprint production still lags, that for the second quarter of 1951 being only 63 per cent of prewar.

Newsprint Supply Co. announced in the fall that, by agreement with the Canadian government, extra newsprint was to be released for consumption during the period of the general election. The additional allowance was to be equivalent to an increase of 9 per cent in permitted consumption of all newspapers for the eight-week rationing period running until November 18.

Finland

The director general of the Bank of Finland has stated that that country can increase its manufacture of newsprint by 50 per cent, or 200,000 tons, during the next three years if it obtains foreign assistance with respect to credit for the purchase of machinery, and if considerable advance payments can be made for paper to be shipped in the future.

Sweden

It is reported that Swedish manufacturers of pulp and paper are seeking rights on the eastern coast of South America, where they will tap the extensive reserve of fast-growing softwoods on the banks of the Parana River in Paraguay and Argentina. Swedish interests have already established plants in southern Chile to exploit that region's coniferous forests.

Sweden produced a total of about 1,200,000 tons of paper and board during 1950, of which about 740,000 tons were exported. Plans provide for an expansion of pulp and board productive capacity during a five-year period to a total of 1,500,000 tons. Consumption is expected to increase simultaneously, with the quantity that may be available for export expected to approximate 900,000 tons.

Canary Islands

The Ministry of Industry has authorized the construction of a woodpulp and paper mill in Tenerife. The mill is expected to produce a total of about 6,000 metric tons annually of kraft, sulphite, and other grades of paper. Banana plant wastes and the wood from various trees are to be utilized. Machinery is to be of Spanish manufacture.

Egypt

An Egyptian board mill, producing approximately 1,800 tons of millboard and imitation shoe board annually, plans to obtain a small tonnage of groundwood pulp from the U.S. for experimental purposes. The mill now uses waste paper exclusively. However, white waste of the quality required is in short supply in the local market.

Philippines

A Manila firm is reported to be building a plant for the production of tissue paper and other allied products. Operations were to start about the end of the year.

Industry Notes

Continental Can Co., Inc.,
has reduced operations nearly 50 per cent at its paper converting plant at Tonawanda, N.Y. Employment has been cut from a high of about 200 to approximately 115, and the plant schedule has been reduced from a two-shift basis to one shift. Officials blamed a lessening demand for fibre containers in the semi-war economy.

International Paper Co.
has recently granted the Union County Soil Conservation District at El Dorado, Ark. 400,000 pine seedlings which are to be planted on farms in the area. The seedlings will be matched with purchases made by cooperating farmers on the basis of one-for-one on plantings up to 20,000. For plantings of between 20,000 and 100,000 trees, they will be matched at the rate of an additional 1,000 trees for each 3,000 purchased by the landowners.

Alabama is the 31st State
to join the Keep America Green movement coordinated by American Forest Products Industries. At a recent program at the state capital the Keep Green banner was officially recognized by Gov. Gordon Persons, who called on all Alabama citizens to support the fire prevention program.

St. Regis Paper Co.
has disclosed that its plant at Eastport, Fla. will have an annual payroll of $3,500,000 when it reaches full operation next year.

Brown & Bigelow,
Minneapolis manufacturer of calendars, playing cards, greeting cards and novelties, has established eight additional sales districts. They are as follows: northern New Jersey; rural Pennsylvania; San Antonio, Texas; Tulsa, Okla.; Queens and the Bronx, N.Y.; Richmond, Va., and Akron, Ohio.

Gaylord Container Corp.,
St. Louis, has announced a proposed pension plan for hourly paid employees. Stockholders have approved the move, as has the Treasury Department. The plan now awaits the sanction of the Wage Stabilization Board.

Fibreboard Products, Inc.,
Antioch, Cal., was host during the last week of October to members of the San Francisco Stock Exchange. Paperboard produced at the pulp and board mill is shipped to other Fibreboard plants for conversion into cartons.

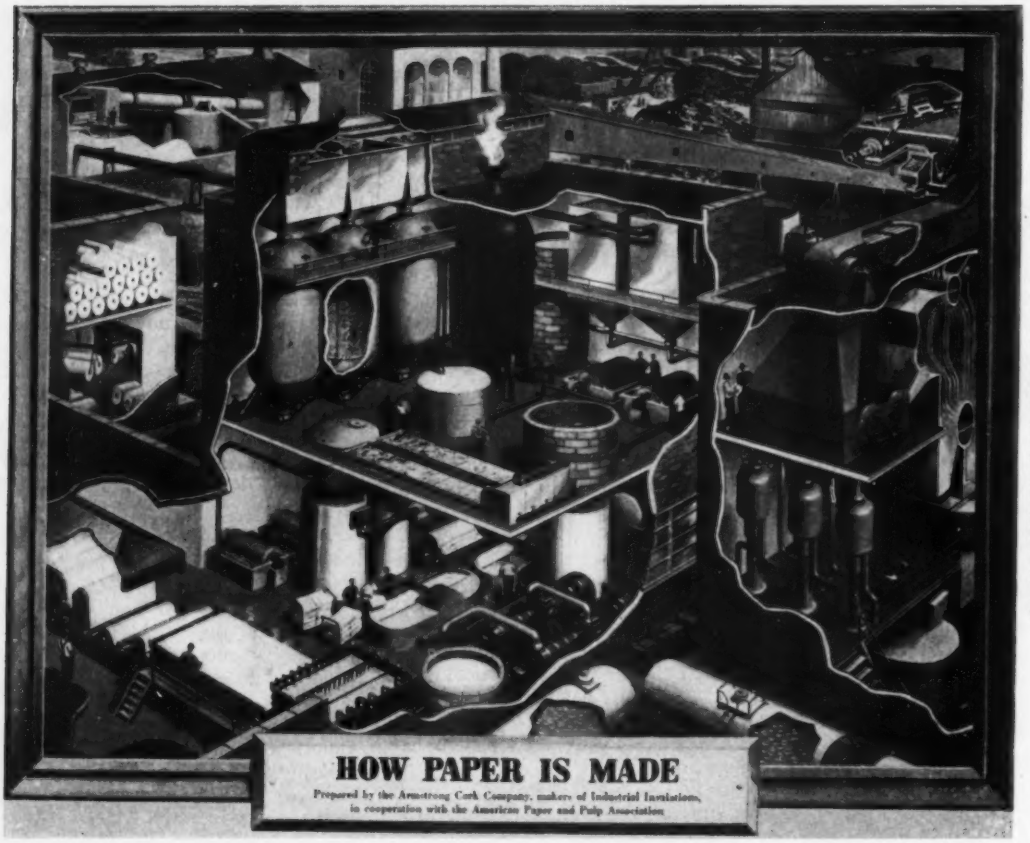
E. W. Twitchell, Inc.,
Philadelphia, has introduced a new rug-backing yarn made of paper wrapped about a core of Fibreglas strands and said to have a number of advantages over cotton, jute, and other materials. The product is being used on a limited scale by leading carpet manufacturers. The yarn, know as Textilene Glascor, costs 40 per cent less than cotton and has a negligible shrinking factor.

$250,000 in Photographic Paper
was destroyed early in November in a fire which swept the upper floors of a storage building owned by Eastman Kodak Co., Rochester, N.Y. About 75 firemen were overcome in the blaze.

Loss Estimated at $10,000
was suffered by Oak Cliff Box Co., Dallas, Texas, in a fire October 16. The building, together with stacks of cardboard, were destroyed.

$10,000 Damage
resulted from a fire in the storage yard of Certain-Teed Products Corp., St. Louis, November 3. The flames swept bales of felt paper, scrap paper, and cord wood.

Cleveland Container Co.,
Cleveland, will distribute its work


HOW PAPER IS MADE
Prepared by the Armstrong Cork Company, makers of Industrial Insulation,
in cooperation with the American Paper and Pulp Association

TYPICAL PULP AND PAPER MILL—This cutaway view was presented in full color in the November 17 issue of *The Saturday Evening Post*. Sponsored by Armstrong Cork Co. in co-operation with the American Paper & Pulp Association, the presentation was designed to tell the general public how paper is made

among its seven plants in other cities until space can be acquired to replace the building destroyed by fire in Cleveland November 1. Collapse of the walls and roof of the building, which contained 150,000 square feet of floor space, kept the fire burning through one day and one night.

Radioactive Dust
from an atomic explosion in Nevada caused operations to be shut down for more than 36 hours at the E. I. du Pont de Nemours & Co. photographic paper-coating plant in Rochester, N.Y., recently. The dust was carried to the earth by snow and sucked into the ventilating system.

Spiral Paper Tube & Core Co.,
Los Angeles, suffered minor damage November 11 when fire of undetermined origin swept the rear of the processing plant.

Alton Box Board Co.,
Alton, Ill., honored 250 employees who have been with the firm 15 years or more at a dinner October 31. The program included awards for employee service made by M. W. Swain, first vice president and general manager.

Union Bag & Paper Corp.,
New York, N.Y., has been judged as having the best annual report in the paper products industry. The firm was recently awarded the "Oscar of Industry" trophy given in the Financial World Survey of Annual Reports. A total of 5,000 annual statements were considered in international competition, the 11th in the series of surveys, and these were judged in 100 classifications for the "Best of Industry" awards.

Kalamazoo Vegetable Parchment Co.,
Kalamazoo, Mich., has granted a 2.3 per cent general wage increase to employees under the jurisdiction of the Paper Makers' Union. In addition, the firm joined the union in a petition to the Wage Stabilization Board requesting approval of a 6-cent-per-hour general increase, time and one-half for Saturday work, and a change in the present vacation plan.

Superior Paper Products Co.,
Crafton, Pa., has reached an agreement with Local 350, CIO Pulp, Sulphite and Paper Workers, to settle a five-week strike of 234 employees. The firm granted wage increases approximating 12 cents an hour, in addition to cost-of-living contract provisions.

300 Delegates
attended the joint convention of two paper mill unions which was held recently in Rhinelander, Wis. Included were representatives of the International Brotherhood of Papermakers and the International Brotherhood of Pulp, Sulphite, and Paper Mill Workers. The delegates were from Wisconsin, upper Michigan, and Minnesota.

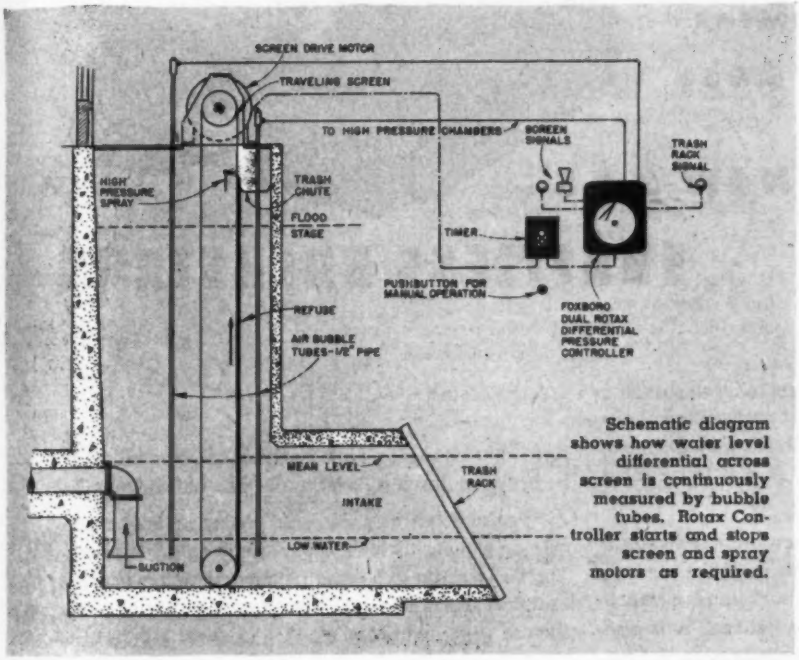
Central Fibre Products Co.,
Quincy, Ill., has reported that employees returned to their jobs November 17 after a brief work stoppage.

Gardner Board & Carton Co.,
Middletown and Lockland, Ohio, has granted some 2,000 employees a 1 per cent cost-of-living wage increase. This gives hourly-paid workers increases of one and two cents per hour. Included are employees of Manchester Machine Co., Middletown, a Gardner subsidiary.

Zellerbach Paper Co.
employees at Los Angeles recently voted in an NLRB election to join the CIO United Paper Workers. The move ousts Harry Bridges' International Longshoremen's and Warehousemen's Union as bargaining agent and follows a nationwide purge of the CIO by anti-Communists.

CIO United Paper Workers Union
was defeated recently in a bargaining rights election held at the Tyrone, Pa., mill of West Virginia Pulp & Paper Co. The NLRB regional office at Pittsburgh reported that the CIO affiliate polled only 172 votes, while 418 ballots were

Make traveling intake screens positively "Plug-Proof"



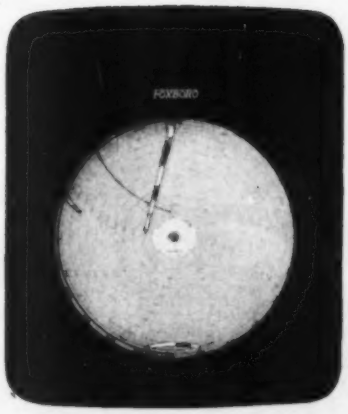
Schematic diagram shows how water level differential across screen is continuously measured by bubble tubes. Rotax Controller starts and stops screen and spray motors as required.

. . . with Foxboro liquid level type screen control

Make sure your intake suction well can't go dry when excessive refuse suddenly piles up on the traveling intake screen!

The Foxboro Traveling Screen Control System automatically starts the screen-rotating motor and the cleansing spray whenever refuse accumulation causes the water level difference between opposite sides of the screen to exceed a certain preset value. Quickly, it purges the screen of refuse and restores the intake level to normal — or sounds an alarm indicating that the cleaning mechanism is unable to cope with the difficulty. What's more, this action takes place only when the screen actually becomes clogged . . . no waste of power or unnecessary wear on mechanism through needless periodic operation.

The Foxboro Traveling Screen Control System is easy to install, inexpensive to operate, and pays big dividends in better intake operation, less maintenance and greater peace of mind. Write for complete information. **The Foxboro Company, 15812 Neponset Ave., Foxboro, Mass., U.S.A.**

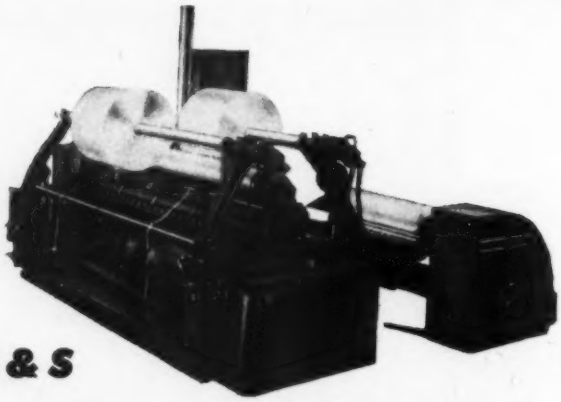


ROTAX Liquid Level Controller. The heart of the system, translates level differential into operation of motors. In addition, it can operate warning horn or light in case of unusually severe fouling. Circular or rectangular case models.

FOXBORO
REG. U. S. PAT. OFF.

INSTRUMENTATION
INDICATING · RECORDING · CONTROLLING

Cut Your Downtime on mill roll changing to 1 Minute or Less



with the **NEW B&S**

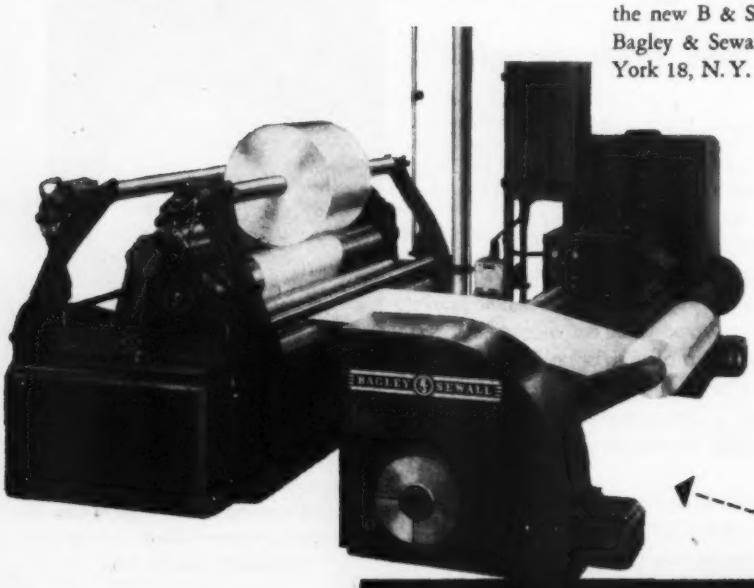
SHAFTLESS BACKSTAND

Money-consuming downtime on mill roll changing is cut to the bone by the wholly automatic B & S Shaftless Backstand. Here is what Mr. C. Carr Sherman, President of H. P. Smith Paper Co., has to say about this equipment:

"The engineering of this new unit indicates a fine understanding of the problems of the users of this type of equipment. The Backstand is much easier to handle as there are no shafts. It is also much easier and faster to make changes on it. I believe that changing rolls with this Backstand can be brought down to well under one half minute."

You may purchase the B & S Shaftless Backstand with or without the new B & S Slitter and Rewinder. The Backstand may be used on any type of rewinding equipment, as well as on waxing and laminating machinery, printing presses, etc.

For full details on the Shaftless Backstand and the new B & S Slitters and Rewinders, write to The Bagley & Sewall Company, 500 Fifth Avenue, New York 18, N.Y.



THE B & S #55 SHAFTLESS BACKSTAND features automatic tension and side register control; motor for raising and lowering mill roll arms, also motor for moving the arms to accommodate different width rolls. Entire working mechanism is totally enclosed.

designers and builders of

BAGLEY & SEWALL

WATERTOWN, NEW YORK

PAPERMAKING MACHINERY

SINCE 1853

500 FIFTH AVE., NEW YORK 18, N. Y.

Foreign Representative: CASTLE & OVERTON, INC., 630 Fifth Avenue, New York 20, N.Y.

cast against union representation. The bargaining unit involves about 615 production workers.

Kimberly-Clark Corp.
recently honored long-service employees at the firm's fifth annual Quarter Century Club dinner held at the Hotel Niagara in Niagara Falls, N.Y. Eighteen new members were inducted into the club. Each member who marks his 25th year of service with the firm during 1951 received a $100 U.S. Savings Bond.

Allied Paper Bag Corp.
held open house at its office and manufacturing facilities in Baltimore, Md., November 16. The facilities comprise a one-story structure with a two-story office section, totalling 30,000 square feet of floor space.

Crystal Tissue Co.,
Middletown, Ohio, was host to officials and sales representatives of Hanchett Paper Co., Chicago, who toured the Crystal mill recently. During their visit, Hanchett personnel followed operations from the pulp yard through finishing and shipping. They were also introduced to many new Crystal product developments.

Sandy Hill Engineer Touring Latin America

Millard F. Hayes Jr., field engineer for The Sandy Hill Iron & Brass Works, Hudson Falls, N. Y., is touring Central and South America for the purpose of surveying a number of areas with a view to their practicability as sites for new paper mills. He is to study the sources and quantity of raw materials, transportation and markets, and also the cost and availability of imported materials. These investigations will be made in cooperation with several South American firms, in addition to U. S. firms contemplating expansion in the area.

Mr. Hill plans to make statistical studies of wood growth per acre and a general comparison of South American and North American wood growth. These studies are being carried out in cooperation with native forestry experts.

Rodney Hunt Machine Co.,
Orange, Mass., has relocated its southern regional office from Greenville, S.C., to the Wilder Bldg. in Charlotte, N.C. A. P. Hyde is in charge.

Interchemical Corp.
has changed the name of its Ink Division to: Interchemical Corp.—Printing Ink Div. The trademark "IPI" is to be retained.

Arcos Corp.
Philadelphia, has appointed exclusive distributors for the St. Louis, Mo., and Des Moines, Iowa, territories. Clements Welding & Machinery Co., St. Louis, will serve parts of Missouri and southern Illinois, while R. & R. Welding Supply Co., Des Moines, will cover central Iowa.

Morningstar, Nicol, Inc.
New York, N.Y., is celebrating its 100th anniversary. The manufacturer of starch, dextrines, and adhesives was founded in New York in 1851 by the late Charles Morningstar, grandfather of the present president. The firm has manufacturing plants in four states and offices in 20.

C. H. Wheeler Mfg. Co.,
Philadelphia, is being consolidated with the Economy Pump Div. of Hamilton-Thomas Corp., Hamilton, Ohio. Production, engineering and sales departments of Economy are being moved to the Philadelphia plant, and Economy Pumps will henceforth be known as Wheeler-Economy Pumps.

Reliance Electric & Engineering Co.,
Cleveland, has opened a branch sales office in Toledo, Ohio. John Drollinger, Jr. has been appointed branch manager. He joined the firm in 1949 on the sales staff of the Detroit office.

Baker Industrial Truck Div.
of Baker-Raulang Co., Cleveland, has announced the appointment of W. T. Billard, Inc., Los Angeles, as the firm's southern California and Arizona representative. The organization will handle all sales, service, and field engineering for Baker in that territory.

Raybestos-Manhattan, Inc.
Passaic, N.J., has announced that production in its new Wabash Div. at Crawfordsville, Ind., has started. The 70,000-square foot plant was constructed to manufacture sintered metal products for the military defense program. Operations are to supplement production of metal clutch plates for tank transmissions at the plant at Stratford, Conn. John H. Matthews, vice president of the Passaic plant, is in charge.

Johnstone Engineering & Machine Co.,
Parkesburg, Pa., has completed the first phase of its expansion program with the construction of a modern addition to its present plant. The building, with a frontage of 169 feet, is built of brick, reinforced concrete, steel and concrete blocks. Erecting space has been doubled, and production is expected to be increased by about 50 per cent.

Pangborn Corp.
manufacturer of blast cleaning and dust control equipment, held its first full scale open house at its Hagerstown, Md., headquarters September 26. All operating and administrative departments were in full operation. Groups were conducted through the plant by specially trained guides. A feature of the celebration was the inauguration of a demonstration room, measuring 58 by 61 feet.

H. L. Barnebey Chemical Processes
is a recently established firm in Pittsburgh for the selection, evaluation, and licensing of important chemical processes. The company was founded by H. L. Barnebey, formerly sales promotion manager of Blaw-Knox Construction Co.

Shell Chemical Corp.,
New York, N. Y., recently announced the opening of a branch sales office in Atlanta. M. W. Ellis of the New York sales staff has been made manager of the new district. The branch will serve southern paper, textile, and furniture industries with solvents, industrial chemicals, plastics, and resins.

Merritt-Chapman & Scott
New York, N.Y., has been awarded the "Oscar of Industry" for the second straight year in the Financial World Survey of Annual Reports as having the best annual report in the construction service industry. A bronze trophy was to be presented the firm at a banquet in New York October 29.

Norton Behr-Manning Overseas, Inc.
Worcester, Mass., is a new export firm recently formed by Norton Co., Worcester, and Behr-Manning Corp., Troy, N.Y. The company will handle all the export business and direct subsidiary plant operations of the two parent concerns throughout the world. Herbert A. Stanton is the newly elected president.

H. K. Porter Co., Inc.
Pittsburgh, has acquired Buffalo Steel Co., Tonawanda, N.Y., producers of light steel products, in a straight cash transaction. Buffalo Steel has a total capacity of 70,000 tons per year, which makes Porter's total steel production in excess of 200,000 tons.

Lynch Corp.
Anderson, Ind., announces the opening of a new Western Division office and warehouse located in San Francisco. Cal B. Pierce is the manager in charge, and Art Nielsen will serve as sales engineer.

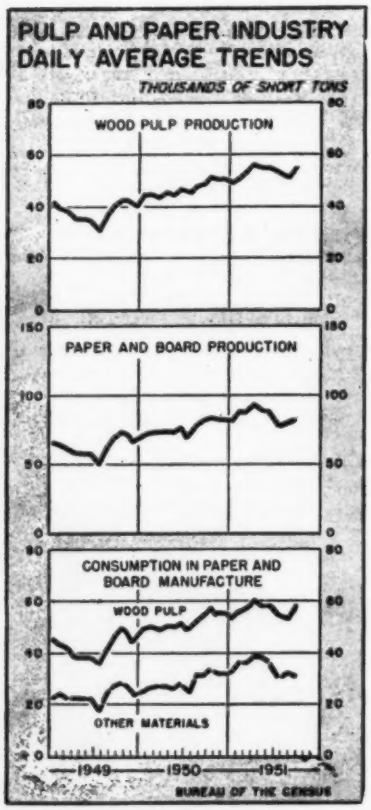
Dow Chemical Co.
Midland, Mich., recently held a hobby show in conjunction with Dow Corning Corp. and Austin Co. More than 65 exhibits were entered in the fields of art, photography, model building, amateur radio, handicraft, and needle work.

Baldwin-Lima-Hamilton Corp.,
Philadelphia, has appointed A. M. Conway & Son of Portland, Ore., as representative and distributor for its hydraulic presses used in the manufacture of insulating board, plywood, hardboard, and other wood products.

Lake States Pulpwood Production on Increase

A recent canvass made by the Lake States Forest Experiment Station at St. Paul, Minn., shows that Lake States pulpwood production amounted to approximately 1,872,000 cords during 1950, as compared with 1,552,000 cords in 1949. Of the regional total, Minnesota produced about 40 per cent, Michigan 35 per cent, and Wisconsin 25 per cent. Although pulpwood cutting was substantially increased over the previous year, it did not reach the high yearly average of 2,150,000 cords attained during the 1946-48 period.

Aspen continued to be the principal pulpwood species, accounting for about 37 per cent. Of the 50 mills operating in the region, all but seven used the wood in varying amounts.



September Pulp, Paper and Board Production

Paper and board production during September amounted to 2,021,545 tons, according to the Bureau of the Census, U.S. Department of Commerce. This is 3 per cent less than the tonnage produced in September a year ago. In terms of production base capacity, the industry operated at 81 per cent in September, with the paper and paperboard sections operating at 92 and 74 per cent, respectively. The comparable ratios for August were: Total, 79 per cent; paper, 87 per cent, and paperboard, 74 per cent.

Pulpwood receipts at the mills during the month were 2,287,634 cords. Consumption at 2,124,460 cords was less than receipts, resulting in a 3 per cent month-end inventory increase to 4,979,706 cords.

Wood pulp production during September amounted to 1,326,720 tons. In terms of production base capacity, pulp production ran at 90 per cent, with sulphate pulp being produced at 93 per cent.

Wood pulp inventories at the end of September at paper and board mills decreased to 496,564 tons from the 506,706 tons reported at the end of August. Month-end stocks at pulp mills increased about 4 per cent to 104,441 tons.

U. S. Paper and Paperboard Production

	Sept. 1951 (tons)	Aug. 1951 (tons)	Sept. 1950 (tons)	Total 1950 (1,000 tons)	Total 1945 (1,000 tons)
Paper and Board, total	2,021,545	2,206,666	2,091,864	24,300	17,371
Paper, total	940,199	992,727	896,610	10,679	7,574
Newsprint	87,622	97,987	90,937	1,017	725
Groundwood paper (uncoated)	67,967	67,763	60,711	694	636
Printing and converting (coated)	88,645	97,305	82,636	1,015	*1,501
Book paper (uncoated)	130,219	139,598	136,055	1,577	
Fine paper (writing, cover and text, bristols, thin paper and other)	110,829	116,506	106,967	1,223	1,001
Coarse paper (unbleached, kraft, glassine, greaseproof, vegetable parchment and other)	296,811	303,033	274,512	3,383	2,403
Special industrial paper	32,468	35,143	23,584	316	238
Sanitary paper	96,841	105,935	90,819	1,108	824
Tissue paper	19,383	20,560	21,228	241	157
Absorbent paper	9,414	8,897	9,161	105	89
Paperboard, total	864,101	976,571	940,176	10,804	7,907
Containerboard, total	470,416	532,947	490,598	5,646	4,131
Liners	314,517	356,953	317,173	3,690	
Corrugating material	136,664	147,981	145,817	1,637	
Container chip	19,235	28,013	27,608	320	
Bending board (folding boxboard)	243,507	280,952	†	2,368	2,092
Nonbending board (set-up boxboard)	61,929	63,003	†	641	721
Cardboard	6,804	7,554	6,020	77	71
All other paperboard	81,445	92,115	174,586[1]	2,071	891
Wet machine board	10,280	12,047	13,084	144	112
Construction paper and board, total	206,965	225,321	241,994	2,673	1,778
Building paper and insulation	104,328	112,777	127,497	1,414	883
Hardboard and insulating board	102,637	112,544	114,497	1,259	895

(*) Total for 1945, combining printing and converting paper and book paper. (†) Data not available due to revision of classifications. ([1]) Figure includes other bending board and other nonbending board.

Source: U. S. Department of Commerce.

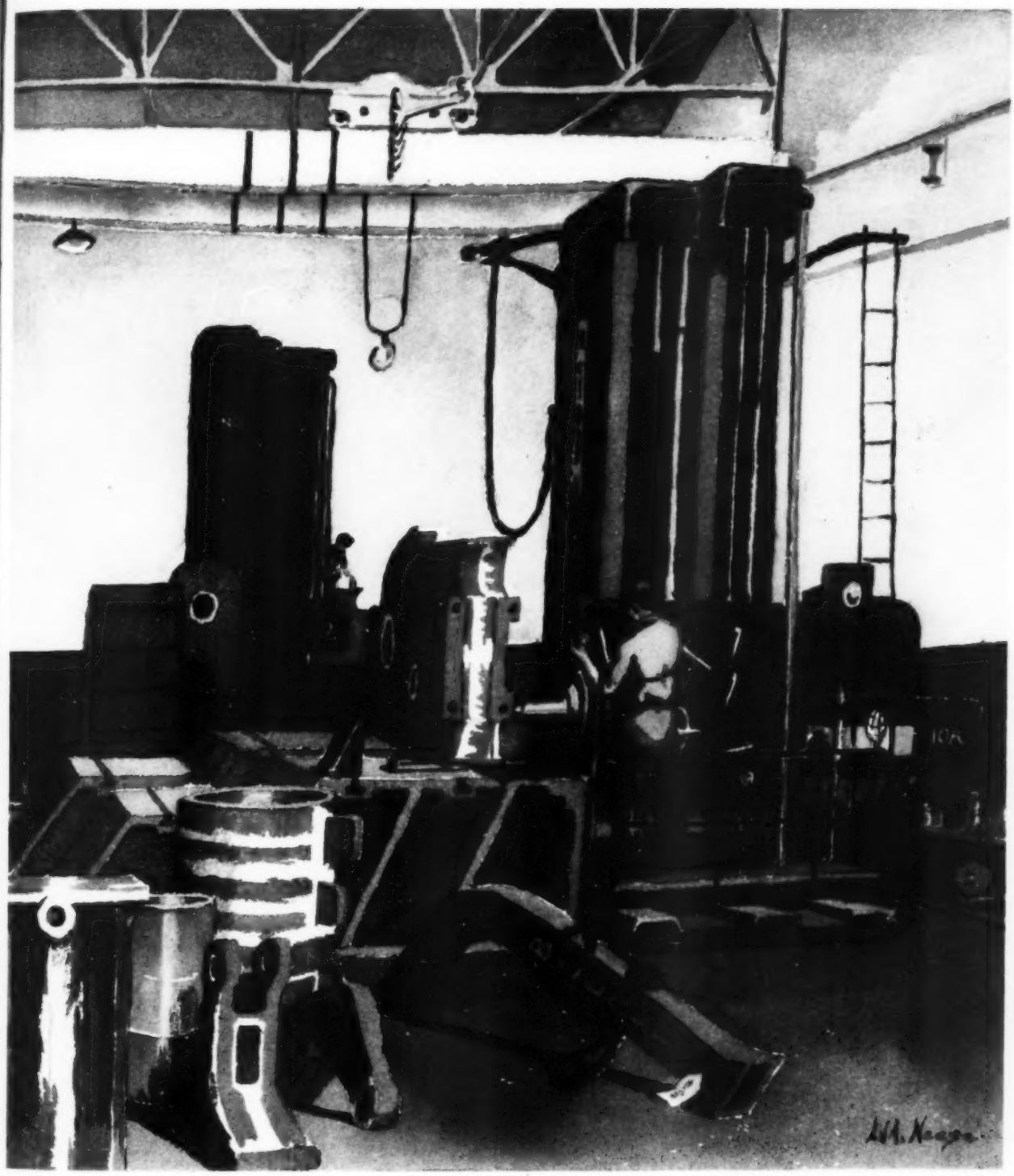
Domestic Wood Pulp Production 14% Ahead of Last Year

Domestic production of wood pulp is running 14 per cent ahead of 1950. Including import balance, new supply available to United States mills is 12 per cent greater. Third quarter gains were somewhat less than in the earlier quarters.

Tonnages for all grades combined for the 1951 and 1950 nine-month periods were as follows: domestic production, 12,369,000 tons in 1951, as against 10,831,000 during the same period last year; imports, 1,834,000 tons, as against 1,764,000 tons; exports, 127,000 tons, as against 59,000 tons, and domestic new supply, 14,076,000 tons, as against 12,536,000 tons.

In the first nine months of 1951 U.S. producers shipped 1,253,000 tons of market pulp for converting mills, while imports provided an additional 1,834,000 tons, making a total of 3,087,000 tons. This contrasts with the 1950 figure of 2,919,000 tons.

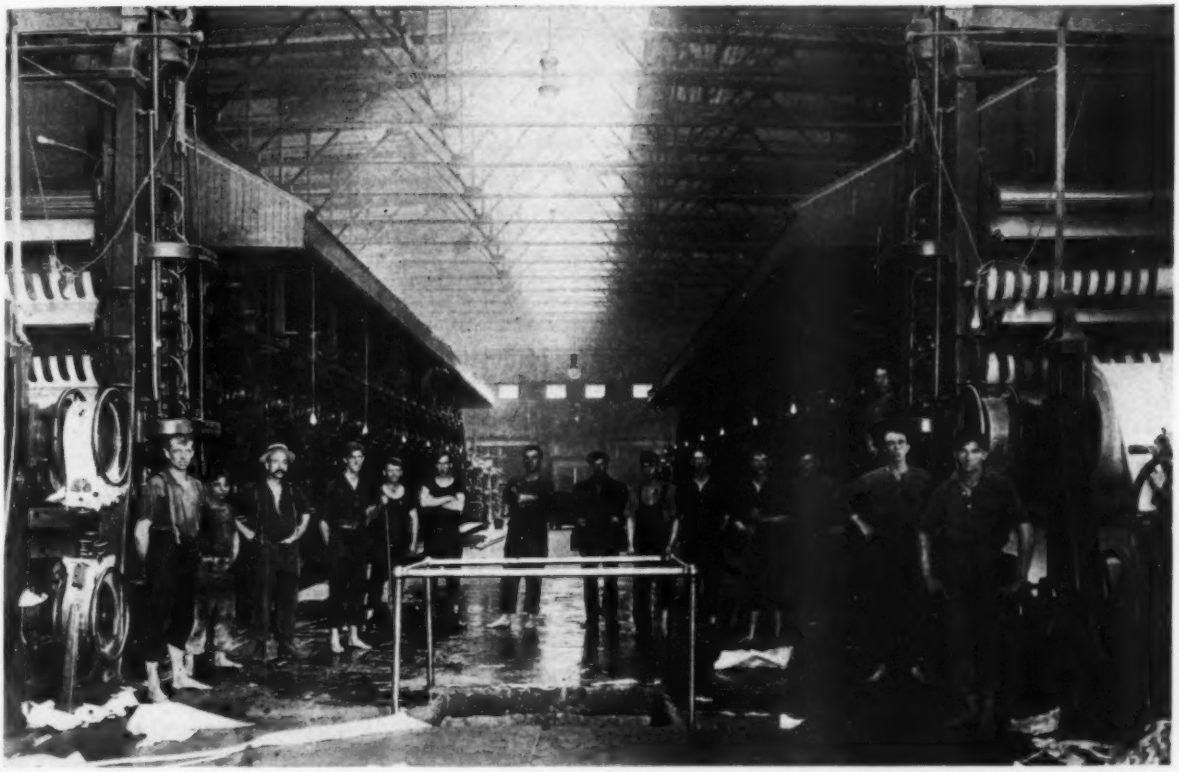
Imports from Canada and Norway were higher than last year, while from all other countries they were lower. During the first nine months of this year, arrivals from Canada totaled 1,424,000 tons, against 1,225,000 tons last year. Norway shipped us 30,000 tons, up from 22,000 tons in the 1950 period. Imports from Sweden declined from 325,000 tons last year to 22,000 tons this year. Nine months imports from other countries dropped to 158,000 tons in 1951 from 193,000 tons in 1950.



WATER COLOR PAINTING BY L. J. A. NEESE

QUALITY MACHINING at Beloit Iron Works, Beloit, Wisconsin—part of the process of building high-speed, high-production paper machines. Huge horizontal boring, drilling and milling machines shown above are among the many types used in specialized operations. Precision equipment, skilled operators, trained inspectors help to hold close tolerances on every part.

The Paper Industry Pictured Highlights

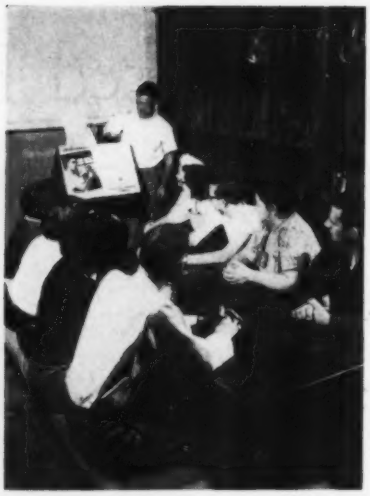


SHOES WEREN'T WORN BY PAPERMAKERS 42 years ago. This picture was taken at the St. Croix Paper Co. mill in Woodland, Maine, September 6, 1909

INSECT CONTROL RESEARCH at the University of Wisconsin being carried out under a foundation sponsored by Nekoosa-Edwards Paper Co., Port Edwards. Aimed primarily at pulpwood damage, the work done is directed by R. D. Shenefelt, entomologist

CONTRACT-SEALING HANDSHAKE is displayed by Samuel Kipnis (right), president of National Container Corp., and Myles C. McGough, vice president of Merritt-Chapman & Scott Co., as they sign the final papers for the erection of National's new 500-ton per day kraft, pulp, board and paper mill near Valdosta, Ga. MC&S will construct the mill. Others in the picture are officials of both companies

1 PERSONAL INTERVIEWS stress the value of safe working



2 GROUP MEETINGS teach various phases of accident prevention

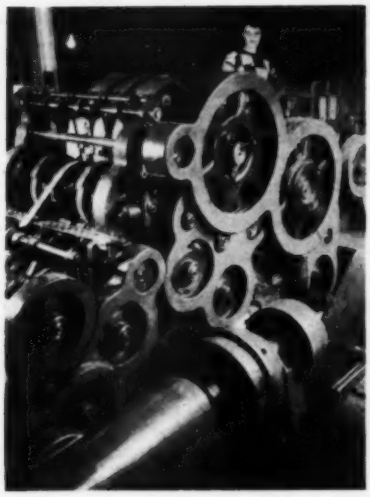
3 JOB INSTRUCTION for new workers points up precautions

Six-step safety program results in . . .

Accident-free Record

ON THE ALLEGHENY RIVER near Pittsburgh, the Oakmont plant employs 180 people in the conversion of kraft into multi-wall bags

4 GOOD HOUSEKEEPING is vital in Oakmont safety program



5 EQUIPMENT GUARDS help reduce on-the-job accidents

6 VISUAL REMINDERS keep safety constantly in the fore

at U. S. Gypsum's Oakmont Plant

E. C. Beuthin
Works Manager

J. W. Adams
Safety Director

SAFETY as a law and not merely as a rule is the philosophy of the program at United States Gypsum Co's. kraft plant at Oakmont, Pa. That program has paid dividends in attaining an accident frequency rate of 0.00 during all of 1950, a record backed up by 17 consecutive months of full operation without an accident requiring a doctor's care.

Honorable Mention

The Oakmont plant received honorable mention for its safety record during the awards program at the recent National Safety Congress held in Chicago. U.S.G. employees were honored for achieving one of the 34 perfect scores reported in the 1950 Paper Industry Safety Contest. The plant was one of the runners-up behind the Williamsburg, Pa., plant of West Virginia Pulp & Paper Co., winner of the grand prize trophy presented annually by THE PAPER INDUSTRY.

Operation

Complete operation at Oakmont covers the production of kraft paper and the conversion of kraft into multi-wall plaster and lime bags. A total of 180 people, including about 55 women, are employed at the plant.

During the contest year 1950 a total of 360,032 man-hours were worked without a lost-time accident. In addition, for the 26 months preceding the closing date of the contest, U.S.G. employees established a record of nearly 750,000 man-hours worked without a reportable injury. Following is the Oakmont frequency rate for the five years prior to 1950: 1949, 0; 1948, 6.68; 1947, 7.58; 1946, 25.54, and 1945, 23.29.

Since January 1, the end of the 1950 contest, Oakmont employees have worked a total of 362,125 man-hours without a lost-time accident, maintaining its 0.00 frequency rate.

Three "E's" Emphasized

The safety program at Oakmont has been expanded and improved by qualified safety engineers during the past 15 years. Outgrowth of long study has been emphasis on the three "E's"—Education, Enforcement, Engineering. And in addition to perfection in safety, the plant has demonstrated one of the most enviable production efficiency records in the entire U.S.G. organization.

Company officials at Oakmont have emphasized that when everyone has a part and everyone is a partner in safety, the results of cooperation are felt both by the employees and by the company in less heartache and in increased efficiency.

General Education

To emphasize the importance of safety in the Oakmont operation, the supervisors throughout the plant stress the value of safe methods to all new employees. Regulations are carefully outlined and a booklet describing the plant's safety "laws" issued. This booklet is required reading before the new worker is assigned. The publication is constantly undergoing revision to contain latest innovations in the practice of safe working.

Personal Instruction

Of utmost importance in the instructions given every new employee by his supervisor are the safety aspects of the operation. Hazards to be encountered are pointed out, necessary precautions explained, and the importance of maintaining equipment guards in place stressed. Frequent checks are made to

assure that the new man or woman is working safely.

Management also takes an active part in safety. Every foreman contacts two employees individually each week. Reports outlining the phases of safety discussed are prepared and delivered to the works manager. Thus, employees are contacted regularly by management on accident prevention.

Reviews and Reminders

In addition to individual employee discussions, frequent group meetings on safety are held at Oakmont. The personnel superintendent presides at a monthly review with the supervisory force, and each foreman conducts a monthly meeting with the employees under his direction. Films, safety graphs, chalk-talks, and lectures are among the methods used to teach the various phases of accident prevention and to all times remind plant personnel of the importance of working carefully.

Safety signs and slogans are used beneficially at the Oakmont operation to keep safety constantly in the minds of plant personnel. Signs are located in strategic areas and are rotated regularly. They are periodically repainted, while new ones are being introduced at all times. Safety officials maintain that this assures good visibility of safety messages and maintains a high level of employee interest.

Equipment Guards

Guarding machines and equipment, such as gears, sprockets, drive chains and belts, is an absolute necessity at Oakmont. Wherever possible, moving parts are enclosed; or, if enclosure is impractical, they are shielded in some other effective manner. Repeated inspections assure that guards are functioning properly and that no dangerous mechanism has been left unguarded.

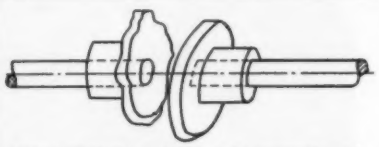
To warn of hazards that cannot be effectively guarded a contrasting paint scheme is used—as on stairway hand rails, on machinery to denote starter buttons and danger points, and on floors at "blind" entrances. Personal protective equipment is required when there is need. Safety shoes and goggles are required on all jobs specified by the Oakmont safety booklet.

Plant Housekeeping

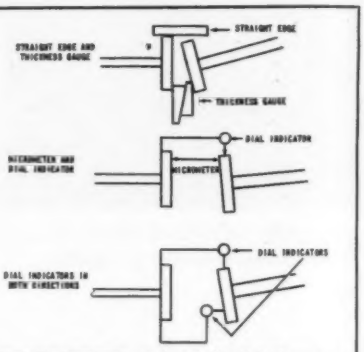
Thorough housekeeping is a requisite throughout the Oakmont plant. Because clean unobstructed aisles are vital to the production scheme, yellow marker lines are painted on the floors to clearly denote passageways with the right-of-way. These aisles are kept free at all times and afford safe passage for personnel on foot, for trucks, carts, dollies, etc. Floors are kept free of grease droppings; and refuse or debris is disposed of immediately.

Employee Interest

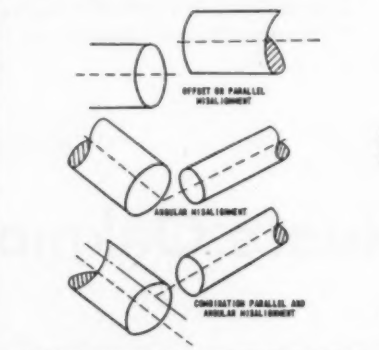
One of the best methods of stimulating employee interest at Oakmont is the pratcice of encouraging suggestions. All personnel are invited to participate in the program. Those suggestions accepted are given prompt action. During 1950 a total of 117 employee ideas were reviewed and dozens put to use. Two typical suggestions receiving attention last year dealt with a covering for the nip point where paper is wound into rolls and with a safety gate controlling electric truck traffic to prevent accidents at the point where paper rolls are removed from the winder.



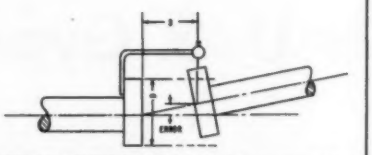
SHAFT ALIGNMENT is possible even in this exaggerated example of coupling surface inaccuracies. Drawing shows that alignment of couplings is no assurance that shafts are aligned. (FIGURE 1)



THREE MOST EFFECTIVE methods of checking shaft alignment are shown above. Method depends upon the equipment and space available. Same components of each are interchangeable. (FIG. 3)



THREE COMMON TYPES of shaft misalignment frequently found in rotating equipment are shown above. Accurate measurements and proper analysis of data can be used to correct each case. (FIGURE 2)



ANGULAR MISALIGNMENT illustrated in this measurement set-up drawing causes a radial runout which is proportional to distance "S." There is no parallel misalignment. (FIGURE 4)

To reduce maintenance and improve operation . . .

Align shafts, not couplings

J. E. PETERMANN and W. F. KING*
Allis-Chalmers Mfg. Co., Milwaukee

CORRECT ALIGNMENT of coupled rotating shafts at regular intervals is a basic must in mechanical maintenance for protecting equipment and maintaining top operating efficency. Such periodic checks are far more desirable than having to put up with downtime, repairs and replacements.

The first thing to remember is that it is *shafts* that need aligning, not the *couplings*. A coupling may be accurately machined, but after being shrunk or pressed onto a shaft, the coupling hub will almost invariably be eccentric with the shaft axis, for it does not deform symmetrically when assembled with an interference fit. It is true that this condition will not affect the performance of a flexible coupling, but it is equally true that alignment of the coupling hubs does not necessarily align the shafts. Also, the correct way of aligning shafts does not depend on the accuracy of the surfaces at which measurements are taken. This is shown clearly in the exaggerated case of inaccurate surfaces illustrated in Fig. 1.

Distinguishing between the error of coupling surfaces and misalignment is simple. Both shafts should be turned equal parts of a revolution, usually 90 degrees, while measurements between the couplings or shafts are taken at the same points on the surfaces at each interval. The reason for this procedure is that the inaccuracies of the surfaces will rotate with the shafts and can be cancelled in the analysis of measurements. The misalignment, on the other hand, will remain constant in direction. If only one shaft is rotated, there must be positive assurance that the surfaces on the stationary shaft, to which measurements are made, are perfectly true. If neither is rotated, it must be assumed optimistically that both are perfectly true.

(*Concluded on page* 1069)

*Mr. King is now with Dynamatic Corp., Kenosha, Wis.

Paper and paperboard making—XX

HARRY WILLIAMSON

Closed white water systems

Installation and operation of a circulating white water system on the *immediate* cycle of supply to the paper machine, closed to the use of fresh water except for showers and start-up and open only as to overflow to the save-all system primary white water, is recognition of the operating fact that: components of the forming sheet of paper of smaller particle size than the wire mesh such as (a) clays, titanium, fine particles of fiber, extremely shortened whole fibers; and (b) sizing agents, colloids, chemicals and colors in solution in water will pass through the wire mesh and a proportion of the *effective value* of these solid and soluble components will then be MINUS from the finished sheet of paper.

It is the intermittent occurrence of these values which necessitates the cost of a testing station at the end of the paper machine. They report the absentees at the end of a reel every X minutes. The finishing department calls the roll at X-x-x-x-x. The complaints from the customer and the figures in the rebate column represent the difference of opinion as to whether all the in-between x's were really caught.

These components, small particle size solids and solubles, will be referred to collectively as FINES. If we flowed nothing but fines on a clean wire mesh the *total* would pass through the wire mesh.

Retention of fines is governed by (1) the physical density of the forming sheet and, (2) the degree of colloidal affinity; which we call hydration, developed on the *base furnish* fibers. These are the fibers which serve the same functional purpose to the paper that structural steel serves in the erection of a building and their selection, proportions and developed values form the basic foundation of the whole paper structure.

This applies to *retention only*. No consideration of other physical values is given. Effective retention capacity by physical density changes with the ream weight of the paper made and the length of the fibers used.

Lighter sheet—faster speed—more water turbulence on the wire—less cubic volume per square inch —therefore less physical density.

Conversely the heavier the sheet the more these factors reverse themselves in favor of greater retention of fines.

In both instances, light and heavy papers, the closed white water system on the machine will build itself to equilibrium and *remain* in equilibrium thus producing an EVEN quality of paper *PROVIDING* the length of the fiber is NOT appreciably changed. Control of the *cutting unit* (jordan) is a necessity.

Effective and even retention capacity of fines by *colloidal affinity* is of *great importance* in the appearance, formation, look-through, and ALL other specifications of a quality paper except strength. Mullen and tear are only affected in minor degree by machine operating variation in the retention of fines.

Starch and size are both colloidal jells used as a contributory aid to the cohesive and adhesive tenacity developed on the fibers by beating. All such colloids possess a colloidal affinity for each other. They will cling and adhere to each other.

The small particles of fibers separated by beater and jordan action from the parent body of the fibers are of such minute physical dimensions they can not interlock or entwine with the larger fibers. In the process of formation they are super-imposed *on*, or deposited *in* the interstices of the larger entwined fibers.

Unless there is a colloidal bond to hold them in position then there will be a greater proportion passing through the wire mesh in the form of fines and carrying soluble sizing agents with them. Such minute particles which remain in the forming sheet and are on or close to the wire side or top side surfaces; (the function of the dandy roll is to bring these fines to the top surface thus providing a better printing surface), will have a greater tendency to fuzz or pick when the forces as represented by the evaporation of water to vapor moisture pressure and the pressure of damp dryer felts are in combination and greater than the tenacity of the hydration colloid now combining with the weaker starch and sizing colloids as they diffuse through the drying sheet by the force of the applied temperature. Note—When the temperature passes the diffusion point of a given colloid and reaches the FUSION point the colloid will reform into minute crystals. These crystals will fall out of the sheet on the dryers or be thrown out of the sheet by the nip pressure of the calender rolls.

As in the instance of physical density retention of fines so it is with colloidal retention of fines. Providing each beater dropped has developed its charge of fiber, particularly and most important the strong base fiber, to the SAME DEGREE OF HYDRATION thus providing the application of an EVEN colloidal affinity force to retain the finest then the machine closed white water system will attain and maintain equilibrium. The resultant paper will be EVEN in quality as far as the effect of the retention of fines is concerned.

Where a closed white water system is used on the paper machine VARIATION IN WORK DONE on the beater charge is the primary cause of many of the rejections of paper for fault either at the mill or from the customer.

For economical reasons and also for actual practical paper making a machine making *fine papers* with

heavily loaded clay and synthetic colloidal content should ALWAYS be equipped with a closed white water system. (Use of fresh water should be provided for in the event of need.) However, the potential danger of a variation in fines content in this circulating water and the CAUSE of such variation should be recognized and the necessary steps taken to narrow the degree of variation to a minimum as to time duration and amount.

The CAUSE and some of the more obvious results are known and have been herewith described. There are other resultant effects that are not so obvious and yet they are equally costly and troublesome.

Chart No. 4 A (given in beater operation studies) provides an actual example. Beaters No. 5 and 3 (both beaters do better work than any of the others) had been dropped between 9:30 and 9:45 a.m. The mixed volume in the screens had built up to a freeness in excess of 200, the build up due to less well beaten stock. The well beaten stock from Nos. 5 and 3 came along and the COLLOIDAL AFFINITY of the developed hydration promptly PICKED up the excess fines from the white water system and caused breaking by dandy marks.

The jordan was pulled off a little thus altering the physical dimensions as a quick relief from immediate trouble, (the only thing to do), but the sheet on the wire was described as TOO SLOW. The stock from beaters Nos. 5 and 3 WAS NOT TOO SLOW. The preceding beaters had been TOO FREE permitting a build up of extra fines in the closed white water system.

The *cure* is to beat off all beaters more nearly equal. The Schopper Riegler test used is far too wide a bracket in the 700 to 850 cc. zone. Actual beater room operating instructions permit the operator, (providing a test is made at all) of 10 cc. reading freeness 800-810. The total volume is 1000 cc. of which 50 cc. is allowed for the wet fibre mat. Only 950 cc. of water as a general average can come out even with raw stock. A bracket of 10 cc. on 800 cc. is 1.25 per cent of the FREE WATER BUT it is 6.6 per cent of the remaining SLOW WATER and that water is the IMPORTANT WATER.

Of course if we are operating in the 500 cc. zone then a bracket of 10 cc. becomes 2 per cent in FREE WATER and 2.04 per cent in SLOW WATER. In such well beaten zones the wet sheet mat test is sufficiently close but in the more free zones the test becomes meaningless for close operation with papers containing high percentage of clays and synthetic colloids.

Louis Schopper recognized these potential errors in the interpretation of his tester and guards against them by insistence on a bone dry sheet test in the more free zones and an elaborate series of addition and subtraction figure columns in the more slow water zones. When using this test paper makers use time in seconds to measure the free water. For instance 700 cc. in 30 seconds would be much more free stock than 700 cc. in 60 seconds.

As far as beater room instructions are concerned 700 cc. is just 700 cc. and is not only meaningless; it is an aid to error because it is *believed* to be helpful and therefore carried out literally regardless of the result. In the instance cited the beater man was making a test and did beat off the stock to the number of cc. as stated. Without the use of time in equating the result his No. 1 beater would have a quick cc. of free water and his No. 5 a slow cc. but they would have the same total figure so the beater engineer and the superintendent and the mill manager would all be operating under the impression that that paper was being made under technical control.

The TIME RATE of formation is that time the sheet has between the slice lip and the edge of the first suction box. After that the sheet is "pinned" into position.

This writer is a *Paper Maker* FIRST and a technician second. As long as scientific methods of testing and checking result in better paper for less dollars and with less physical effort or mental worry he will not only use the existing technical tests he will sit up nights to devise new ones to contribute further to that desirable end.

When any scientific test, regardless of how well based it is in laboratory practice, fails to afford quick and accurate action in the control of beater room operations then in this writer's opinion it is worthless.

The S/W test was devised to correct the errors described and each grade of paper made should, as opportunity affords, be established by the methods set up in the beater study report. This can be done by one tour per grade or a cycle of three rounds of beaters. However, there must be no skipping of the time of taking the test even though it is tiring to keep up for eight hours. Every twenty minutes means JUST THAT with an allowance of five minutes plus or minus. There must be ACCURATE reading and recording of all data and the equations worked out to the third decimal place.

These points are stressed because the work will form a TRUE FOUNDATION for your beater room instructions. Properly done and then *carefully* and *insistently* carried out this will close up these brackets of error which prove so costly. Remember this mill is shooting for the highest possible mark of QUALITY and complete accuracy of the basic groundwork for the establishment of operating instructions is a necessity.

The necessity of care taken in making these foundation tests is not over drawn. Extreme accuracy becomes monotonous unless the individual is fully interested mentally, or is aware that evasion of accuracy will be quickly detected.

Foam killing agents

The necessary use of a foam-killing agent in the closed white water system is another of those not so obvious costly trouble causes. All such agents, by their chemical composition, will tend to coagulate fines, solids, and soluble colloids, together in lumps.

This is well known so that careful regulation of the AMOUNT in volume and strength of the foam killing agent must be established.

When there is a build up of the fines due to stock coming to the machine that has NOT been developed to the right degree of hydration and therefore has LESS colloidal affinity for fines then the regulated

application of foam killing agent is out of proportion to the CONSISTENCY of the closed white water system. The foam killer is provided for a short time with a regular feast and goes to work on the business of coagulation with gusto.

The net result is creation of SLIME SPOTS. Some of these get broken up by the vortex action of centrifugal dirt removal units, but a lot of them just *do not get broken up* and result in increased finishing room sorting costs. It must also be remembered that such units do their best work on material of higher specific gravity than that of fibre and at a consistency of one per cent or less and with a pressure differential of 15 lb. When making heavy weight papers your consistency going through the dirt removal system is ALWAYS higher than 1.2 per cent, the dirt removal unit is operating just outside its best efficiency range (not too much so for actual dirt) and is presented with coagulated fines which are so close to the specific gravity of fibre that it cannot break them up. If the core of the slime spot happens to be a particle of clay then the dirt removal unit will probably break it up.

SLIME SPOTS of fine particles of *fibre, clay and soluble colloids*, coagulated by the foam killing agent, are tenacious by virtue of the holding power of colloidal jells to fibre, usually wind up on the paper sorting tables.

The fines are a most important component of the finished paper. A variation in the proportion of fines is bound to mean a variation in one or more qualities of the finished paper. The CAUSE of such variation has been adequately described and detailed. The CURE of such variation is mainly in the control of the degree of hydration necessary to create the colloidal affinity of the base furnish to the fines. The secondary aid is control of the physical dimensions of the fibres.

Paper Mill Power—Part 8

Comparison and selection of fuels

DAVID MOFFAT MYERS
Myers & Addington, New York

CHOICE OF FUEL or fuels to be burned is of primary importance. Economy of steam production necessarily demands a comparison of the cost per million Btu. as purchased for the different fuels in the local market.

To facilitate such comparison, a set of values has been computed covering the three most common boiler fuels, bituminous coal at 13,000 Btu. per pound, natural gas at 1,100 Btu. per cubic foot, and No. 6 fuel oil at 150,000 Btu. per gallon.

These values are presented in the form of a chart. From this it can be seen, for example, that the purchased heat value per dollar is the same for all three fuels with coal at $7.80 per ton, natural gas at 33 cents per thousand cubic feet, and fuel oil at 4.5 cents per gallon. Any other break-even points can be read from the chart.

If the coal is $9 and gas is 25 cents and oil is 6 cents, the respective unit purchased costs are 34.6 cents, 22.7 cents, and 40 cents. Thus any comparison can be made within the range of prices shown.

The Btu. per unit content used as the basis of the chart is fairly representative of the respective fuels, but may vary from those prevailing in a local market, especially for the coal, so that suitable adjustment may be needed and applied. The use of the chart, however, will provide the first necessary step toward selection.

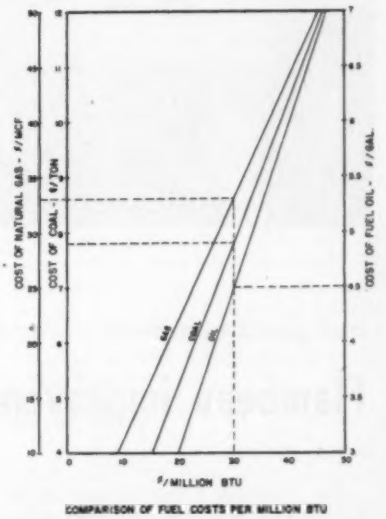
Selection of coal solely on the basis of the cost of heat content is not a sound practice. Volatile matter, mositure, sulphur, ash with its fusion point and composition, together with the burning characteristics of the coal, all have their particular effect on boiler efficiency and furnace design.

The oil or gas fuel may result in a nice saving in the cost of labor and of coal and ash handling, which can be readily computed for any particular case.

In the event of a close choice, another factor to be regarded is the net boiler efficiency connected with the burning of each of these fuels. Due chiefly to the characteristically different contents of water and hydrogen, the maximum boiler efficiency under equally favorable conditions will vary. As a general rule, the gas will produce the lowest efficiency, the coal the highest, with the oil in between. The total range may be in the order of 4 to 5 per cent of efficiency. The greater part of the total differential will likely be between the oil and the gas. The water, and the hydrogen which burns to water, carry away in the exit gases not only sensible heat due to temperature rise but the latent heat of the resultant steam as well. The choice of fuels, however, will seldom be so narrow as to be decided by this factor.

The cleanliness of the gas and oil fuels is an attractive advantage of considerable importance in a paper mill. Also, gas requires no storage and is paid for only as used. Neither fuel requires flyash or cinder catchers, and some capital cost is saved.

When a new boiler is to be purchased, its furnace volume and radiant heat absorption surfaces can be designed to burn any of the three fuels separately or in



COMPARISON OF FUEL COSTS PER MILLION BTU

combination. If it is designed only for oil or gas, a lower capacity rating will be necessary with coal firing.

As previously indicated, it is usually wise to design the boiler to burn at least any two of the three fuels which may be available.

In considering changing fuel in an existing installation, the furnace design should be checked for suitability. Flame distribution, radiant and convection heat absorption, and temperature gradients will differ with the several fuels discussed and will in turn contribute certain effects on superheat, efficiency, and capacity.

All of these factors can be determined and usually adjusted, once the correct choice of fuels has been made, and that is the first thing to do.

Hot pond construction is part of . . .

Flambeau improvement program

The Flambeau Paper Division of the Kansas City Star Company built a hot pond and revamped the rest of the woodroom equipment during this past summer.

The hot pond was constructed of reinforced concrete in two sections over 240 feet long. The wood is unloaded with a Browning Crane with a ½ cord clamshell bucket at the opposite end of the pond from the slasher. Water circulated by a pump forces the wood to float in a solid raft the length of the pond and against the slasher chains.

The new slasher of a radically new design cuts the wood into 50-inch lengths and dumps directly into the 12′ x 45′ Fibre Making Processes drum barker. After the bark is removed the wood is discharged into new conveyors for sorting and splitting. The clean wood drops into a new D. J. Murray 10-knife chipper which blows the chips to a cyclone that drops them on the chip screen.

The oversized chips are cut to proper length by a new D. J. Murray rechipper equipped with a blower. The rechipped wood is blown back to the chip screen for final classification.

Changes have also been made in the bark disposal equipment. The bark press has been rebuilt and two new Tyler vibrating screens installed to rescreen the barking drum water. The bark conveyors have also been streamlined.

The new hot pond and woodroom arrangement improves the wood cleaning and delivers more uniform, better quality, and cleaner chips to the digesters. It speeds up the chip production and eliminates 8 men as well as cutting maintenance to a large extent.

The floor space vacated by these changes will be utilized for two new chip silos and the remainder for a substantial increase in warehouse capacity.

Will erect new chip silos

Two tile chip silos, with chip conveyors, elevators, and feeders, will be erected at the Park Falls Mill. Contracts are being let and construction was started on October 2nd by C. R. Meyer Construction Company. The new equipment will start operating next summer.

The silos will be 22 feet in diameter and the straight section will be 52 feet high with a 35 degree steel cone and rotary feeder at the bottom. The construction will be steel reinforced concrete up to the top of the steel cone and steel reinforced hollow tile from there to the top, furnished and erected by Chemical Linings Company. Chips will be carried to the top of the silos by a bucket elevator and distributed to either silo No. 1 by a slide or to No. 2 by a 24-inch rubber belt. Chips will be removed from the bottom of the silos by rotary chip feeders with masts to induce a uniform flow of chips while filling the digesters. The chips will be conveyed away from the feeders to the second bucket elevator by a 42-inch wide rubber belt. The elevator delivers the chips to a 36-inch wide, 16½ degree inclined conveyor. The inclined conveyor dumps on a shuttle conveyor that delivers chips to each of the 3 digesters as desired. All the conveying and feeding equipment will be supplied by Link Belt Co. from their Minneapolis plant. Manhattan is supplying the rubber belting.

The foundations of the silos are in the sulphite woodroom in space recently vacated by streamlining the woodroom. The foundations up to the top of the cones will be installed this fall and early winter, and the erection and installation of the rest of the equipment will be completed as far as possible before the annual vacation period. During the July shut down in 1952 the final changes will be made.

The installation of the new equipment will not interrupt the normal operating schedule of the mill. The new silos are expected to make some improvement in quality of papers. They will insure good, trouble-free digester operation as well as making some increase in sulphite production.

Immediately upon completing the changes in equipment, the skyline of the mill, which has been a landmark for over 30 years, will be changed by removal of the old equipment, chip tank, and elevator.

New generator to be installed

A new 500 KVA generator will replace one of the water wheel grinders at Flambeau. Orders have been placed,

Continued on page 1058

Hazard minimized by observing rules for . . .

Safety in caustic and recovery operations

FRED O. SOUGHTON
and GORDON ROWLANDSON
LongLac Pulp & Paper Co., Ltd.

CAUSTIC OPERATIONS in a sulphate or kraft pulp mill present hazards to personnel that, for the most part, can be minimized by observing proper precautions. This article outlines such hazards and suggests some precautions and safe methods that should be followed.

The caustic liquor room in a sulphate pulp mill may be described as that department wherein cooking liquors are made up or reconverted for us in processing chipped wood by cooking in digesters. The sequence of operations is briefly as follows:

Green liquor from the smelt dissolving tank is reacted upon with lime on a continuous or batch-wise basis. The resultant white liquor (after various means of clarification) is pumped to digesters for use as the cooking medium. Lime mud, thickened in the aforementioned clarification phase is washed and may be sewered or thickened on a vacuum filter, reburned, and returned to the system for re-treating more green liquor. Black liquor, removed from the digesters following the cooking process, is concentrated by evaporation and burned to recover chemicals and generate steam.

Principal hazards

The principal hazards that exist are the possibility of burns due to liquor splashing on skin, hair or eyes; scalds from hot vapors; lime burns due to dust slaking in perspiration on the skin; thermal burns due to high temperatures or smelt spatter; acid burns; fire flashback; eye irritations and dermatitis.

Lime

This raw material may be purchased as quicklime or limestone with consumer specifications based on the type of service equipment and storage facilities employed, availability of supplies and costs.

If limestone (calcium carbonate) is utilized as make-up, it is usually stockpiled and crews engaged here must watch their footing on the limestone lumps to prevent sprained ankles or falls. Gloves and safety boots should be worn by handlers who should be taught and repeatedly cautioned to lift

F. O. Soughton

G. Rowlandson

with leg and not back muscles. Ramps or platforms from the limestone piles to elevator or conveyor should have a smooth non-slip surface and be preferably level. If wheelbarrows are employed as hand-operated conveyances, they should be equipped with inflated rubber tires to reduce hazards that normally exist with metal rim wheels.

Limestone lumps are usually fed along with recovered mud by means of a screw conveyor into the kiln. There the lime is burned or calcined to produce quicklime or calcined lime (calcium oxide). The feed screw conveyor should be adequately protected with a wire mesh guard.

Some mills purchase calcined lime as such and in this form it may be fed directly into the causticization reaction stage. This type of lime varies considerably in particle size depending upon the sorting, crushing and screening phases involved. However, considerable lime dust always exists which can cause discomfort and burns to the unloading or handling crews unless adequate safety precautions are taken. Utilization of hopper bottom railroad cars, sub-rail storage or conveyances, or pneumatic unloading systems greatly reduce the problems of lime handling.

Lightweight dust respirators should be employed by those working around lime dust (a flex foam filter mask is recommended). Dustproof goggles with felt baffled vent ports should also be worn. Operators should change clothes frequently as the lime impregnations will slake when in contact with perspiration and cause painful slow-healing burns. Application of the proper type of protective cream to thoroughly cleaned skin prior to commencing work is helpful. Frequent and liberal applications of talcum powder to areas where clothing rubs (e.g., neckline and wrists) has also proved to be very effective. Sufficient ventilation should be provided in areas where lime is handled to lessen the tendency to perspire. Adequate change of air to remove disturbed lime dust particles will also reduce the hazard.

The lime kiln firing hood should be equipped with a cobalt blue inspection port to protect the eyes.

Persons found allergic to lime dust may have to be employed only in areas free from such dust.

When cleaning or scouring mud filter face wire with inhibited muriatic acid, persons so engaged should wear protective clothing such as rubber or acid-proof gloves, rubber jackets and preferably full face respirators equipped with the proper type of cannister approved by the Bureau of Mines.

Due to the high temperature (in excess of 1800 degrees F.) necessary for the calcining of lime, the danger of thermal burns exists, hence the lime kiln hot zone should be guarded with suitable railing. Workers should be encouraged to take salt tablets to replace salt lost by perspiration, and should avoid exposure to cold air drafts.

Lime, used in any phase of the process, should be prevented from coming in contact with water because of the heat produced by chemical reaction which sometimes reaches the violent explosive stage.

All stairways, steps, platforms or ramps in the lime kiln area should be constructed of metal or concrete due to the fire hazard problems created by high temperatures. Due consideration should be given to heat radiation as it might affect workers.

Green liquor

Liquor from the recovery furnace smelt dissolving tank is called green liquor due to its colour (green with a blackish hue) which is due to impurities dissolved and suspended in the solution (principally chromium with some iron, although aluminum and traces of carbon are also present).

While components of green liquor are many, prime constituents are sodium carbonate, sodium sulphide, unconverted sodium sulphate, sodium silicates and insolubles. Some mills ignore the insoluble portions suspended in the green liquor and it is causticized directly with lime, in which case the insolubles settle out with the lime mud (calcium carbonate) and a clear "white liquor" results.

The settling chambers, clarifiers or thickeners and storage tanks for liquor or mud should be cleaned out regularly for inspections and repairs, and herein

*Mr. Soughton is Service and Safety Supervisor, and Mr. Rowlandson is Pulp Dept. Superintendent at the LongLac Pulp & Paper Co., Ltd., Terrace Bay, Ontario.

This article was adopted from a first draft of a proposed data sheet for the Pulp and Paper Section of the National Safety Council.

exists the danger of burns due to physical contact with the corrosive liquors and mud. Workers so employed should use an acid hood (preferably the vented and air-cooled type) to reduce perspiring and prevent fogging of eyepieces. Protective clothing (jackets, pants and gloves) of rubber, neoprene or alkali resistant plastic should also be worn along with rubber boots. A means of injecting fresh cool air into confined work areas such as tanks aids immeasurably.

Emergency shower facilities should be provided in the liquor room serviced with water from which the chill has been removed. Such showers should be located so that the tripping mechanism may be found readily by following a railing or wall. This is particularly important if a worker is temporarily blinded by chemical splashing in the eyes.

Provision should be made to vent to the atmosphere the obnoxious fumes from all liquor storage tanks, reaction vessels, etc.

To reduce the intensity of explosions when hot smelt spatters into dissolving tank liquors, the temperature of the feed solution should be maintained at a fairly high level. The high temperature of the liquor presents a hazard since dissolved chemicals in this state rapidly attack tissue, skin and eyes. Goggles, facepieces and protective clothing are therefore required and wearing of same should be enforced by suitable rules. All workers on maintenance or operational crews should be taught to never observe conditions of pipes, pumps, valve packings or leaks with the naked eye. Goggles should always be worn.

Lime mud (precipitated, settled or thickened lime) either in the clarification or rewashing phases, contains considerable alkali and for this reason should be treated accordingly because of the burning action when in contact with skin or eyes.

The feed mechanism for fresh and reburned lime should be designed and green liquor temperatures and flow so controlled that boil-overs at the slaker are prevented.

White liquor

This solution, used in the cooking phase, varies in colour from pale yellow to quite a reddish shade, the intensity of hue depending upon the percentage and composition of the sulphur components. White liquor is chiefly caustic soda (sodium hydroxide and sodium sulphide with some sodium carbonate and sodium sulphate). The ratio of components is controlled to suit process requirements. White liquor, being caustic soda principally, attacks skin and tissue with little or no stinging sensation at the onset. Suitable protective equipment should therefore be worn as required.

Black liquor

This liquor is black in colour and is composed of spent chemicals from the white liquor used in the digestion phase along with dissolved portions of the cooked wood. Black liquor is concentrated by various means of evaporation and burned to recover chemicals and generate steam.

Black liquor, either dilute or concentrated, is caustic and should be handled in the same manner as green or white liquors. Usually black liquor is hot and workers must therefore wear protective goggles, clothing and gloves to combat splashing or contact.

Overflows or splashes of black liquor or black liquor soap should be treated with respect and rinsed well to the sewer as both are extremely slippery. For sewering purposes adequate U-drains should be provided with covers of metal grating or corrugated plate as the location demands.

Water must never be sprayed on burning black ash as explosive fires would result. In case of such fire, CO_2 extinguishers should be used.

General maintenance

While items related to maintenance have been incorporated in a number of the preceding paragraphs, there are additional factors which should receive particular attention under this heading.

Plant maintenance should be kept at such a level as to eliminate, as much as possible, any liquor leakage. Many advancements have been made with new alloys (stainless steel, etc.) which withstand the attack of liquors and these should be used whenever possible to eliminate pipe and tank failure through rupture or leakage.

When cleaning out a liquor tank it should be first thoroughly flushed with water and drained. All liquor valves entering and leaving the tank should be blanked and tagged. Extension cords employed within the confines of the tank should be alkaliproof and all electrical equipment thoroughly grounded.

When maintenance work is to be carried out on tanks, vessels and pipes, etc., operating crews should make necessary preparations and assist in flushing out said equipment. Co-operating with maintenance crews, they should also see that correct valves or blanks are shut off or installed to prevent accidents.

When there is a possibility of maintenance crews being exposed to splash or spray hazards involving liquors or any chemicals used in the process, water hoses in the immediate vicinity should be kept running for use in flushing off chemical in case of accident. Workers should also be cautioned to check themselves over thoroughly after working around caustic liquors to insure that no clothing or skin has been attacked. There is no warning sting with caustic liquor as with acid, and a burn can make considerable headway before it is noticed, if unattended.

Adequate supplies of 3 per cent acetic acid may be made available in containers which cannot be contaminated for use in neutralization of caustic chemicals or liquor in case of accident, although flushing with plenty of water does a good job if followed promptly by first aid treatment and the improper use of acetic acid is thereby eliminated.

Unplugging plugged liquor or mud lines requires extreme care as compressed air is generally used in addition to water. Occasionally the plugged line may clear suddenly resulting in an overflow or splash. Workers on these jobs and those in the immediate area should therefore wear protective hats, face shields, gloves and rubber clothing.

When maintenance work is being performed where there is any danger to persons passing by, areas should be roped off and adequate warning signs placed in strategic locations in aisles or passageways to prevent persons from inadvertently walking into a danger area.

When welding is being carried out, suitable shields should surround the immediate work area to protect nearby workers from flash. Welders and helpers should wear sufficient protective clothing to cope with the hazards of the particular job being performed. The proper type of fire extinguisher should also be on hand to control fire which might develop.

Miscellaneous

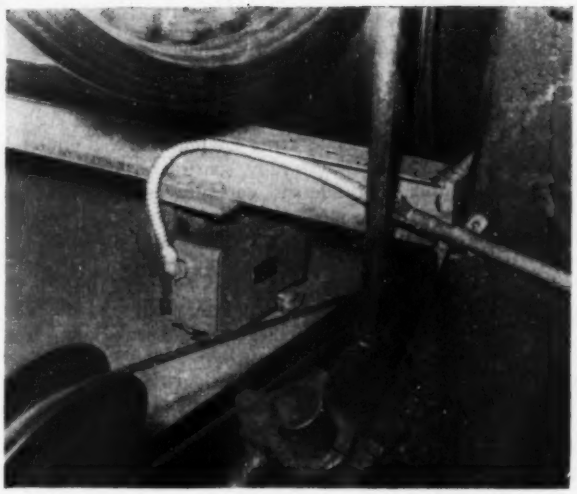
Care should be taken to establish adequate sampling points throughout the process which will enable testers to procure samples with a minimum of risk. Such sampling points should be provided with splash aprons, shut-off valves and catch funnels to ensure that there will be no drip or splash on to the person taking the sample or anyone passing by.

Operators and testers should be well instructed regarding hazards which may be encountered in the normal analysis of liquors and chemicals.

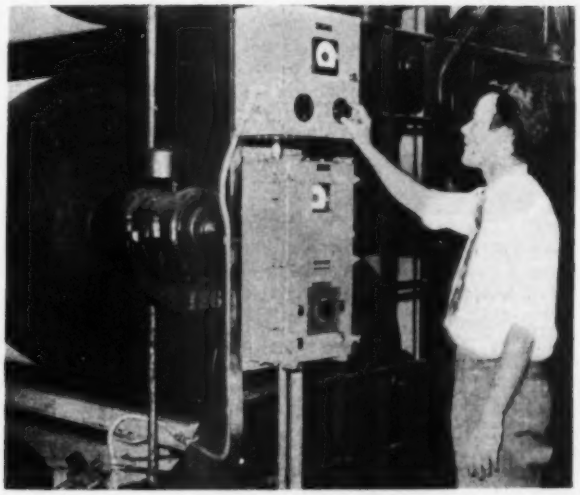
Cotton shirts and pants or khakis are recommended for workmen around alkalis which readily attack wool.

Permanent access by way of stairways, permanent ladders, platforms, catwalks, etc., should be installed with suitable railings and kick plates.

Appropriate warning signs should be permamently attached to all vessels or equipment where particular hazards are constantly present (e.g., "Caustic Liquor," "Watch out for Boil-Overs"). Such signs serve as a continual reminder and are particularly important as a warning to persons unfamiliar with hazardous areas.



General Electric tensiometer installed between last two dryers on board machine; tension sensing roll touches sheet from top



Paper tension can be adjusted manually or it can be set for automatic control at the desired value

Ohio Boxboard uses G-E tensiometer for

Automatic control of paper tension

G. C. EHEMAN, JR.
Plant Engineer
Ohio Boxboard Co.

R. C. BERGER and W. MIKELSON
Applications Engineers
General Electric Co.

OHIO BOXBOARD CO., Rittman, Ohio has installed modern drive equipment with electronic-amplidyne control which enables its machines to increase the production of high quality paperboard. This mill has a daily production in excess of 500 tons of paperboard of all grades including patent coated, jute, manila lined, news board, chip, corrugated liner and laminated container board.

The new equipment is used on three paper machines. It includes G-E multiple generator sectional drives with electronic amplidyne regulators and with a new type of paper tension control between consecutive sections at the dry end of the machine. Accurate tension control is provided by the new paper tensiometers, developed by the General Electric Company, which continuously feel the tension of the board being produced by the machine and provide a signal for indication and automatic control.

Drive makeup

The sectional drive on one of the machines powers a group of 17 individual machine sections. Each of the sections, first press with wet end helper motors, second and third press, nine drier sections, three calender stacks, reel and/or cutter sections, is mechanically independent of all other units. Electrical coordination of speed and tension tie the sections together and provide a closely integrated control throughout.

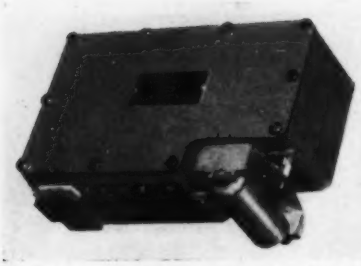
Each section is driven by a DC motor through a gear reduction unit. Each section motor is supplied by its own individual generator. Coupled directly to the motor shaft is the speed detector, a DC tachometer-generator which continuously monitors the speed and generates a DC voltage proportional to speed. This speed voltage is compared to a master speed reference voltage obtained from an electronically regulated DC supply. The output of the comparison circuit is fed to a high gain, high power amplifying system consisting of an electronic pre-amplifier, an amplidyne power amplifier, and a DC generator. This system supplies power to the section motor armature and adjusts speed through control of armature voltage. The motor field operates at rated current at all times thus assuring maximum torque efficiency. The master speed reference voltage is common to all sections and the adjustment of this voltage determines the speed of the entire machine.

If the speed is right, the voltage of the DC tachometer generator is essentially equal to the reference voltage. If the speed starts to change slightly due to a load change or for any other reason, the output of the tachometer generator immediately changes, impressing an error voltage to the amplifying system of sufficient magnitude to force the motor speed to remain constant. A change of a small fraction of a volt input to the amplifier corresponding to a minute speed error is sufficient to drive the generator voltage from zero to maximum. Thus the system has a high sensitivity and is capable of quickly applying tremendous corrective effort to control motor speed accurately.

Speed control at wet end sections

Overall machine speed can be adjusted smoothly over a wide range to permit making various grades of board by means of a master speed rheostat at a central location which conotrols the reference voltage to all sections. With one master rheostat, this system is capable of controlling the whole machine, having a total of 32 drive motors ranging from 5 to 100 hp. and amounting to more than 750 hp. of adjustable speed drive. For purposes of maintenance, washing, or machine adjustment, however, each section may be controlled individually through all required operations from jogging to full run.

Because each section drive is supplied from its own generator, the drive is unaffected by disturbances accompanying starting and stopping of other sections or by loaod changes such as calender "plugs" and "snap-offs."



General Electric Paper Tensiometer showing assembly and close up of the leaf spring and attached tension sensing roll which is pressed lightly into the sheet to feel paper tension. Leaf spring length is adjusted by positioning the clamping block at left and set initially to suit the weights of paper being made on the machine on which it is mounted.

Independent "draw" adjustment for each section is obtained at section operator's panels by adjusting a dial which turns a rheostat connected into the tachometer generator circuit, providing fine adjustment of section speed.

Paper tension control at dry end sections

At the dry end, starting with the seventh dryer, successive sections are controlled by the tensiometers. These actually feel the tension of the board ahead of each section. Each tensiometer provides the controlling signal for the section which follows it to control motor speed and hold sheet tension constant.

Where there are many dryer sections, changes in steam temperature and pressure cause variations in paper shinkage. Moisture content and, therefore, shrinkage is affected also by wet end factors such as stock freeness, stock consistency, flow, vacuum, nip pressure, etc. Varying shrinkage can cause paper breaks on ordinary speed regulated sections unless watched and compensated occasionally by manual speed conotrol. With paper tension control, this is done automatically.

Machines usually run continuously at constant speed, but frequently, the speed is increased or decreased to change weight and thickness. This sometimes is done without removing the sheet. Since it takes one minute or more after a speed change for the old weight sheet to run out and the new weight sheet to cover the machine, the "drying" rates temporarily are upset, thus shrinkage is upset and breaks may result, unless automatic paper control is used.

Improvement over previous methods

Heretofore, constant current control of the motor has been used at calender stacks and reels to control paper tension. This regulated current has to handle friction load, nip load, and tension load. If the bearing friction and nip loads stay constant, the tension is constant. In some cases, this can be far from true. At a calender for instance, bearing friction changes. Worse yet, the working load in the nips of a stack of calender rolls is relatively high and is affected by nip pressure and by moisture variations in the sheet. Thus, the portion of the regulated motor current which is left over for tension can vary appreciably. In addition, variations in tension in the sheet leaving the calender to the next section reflect directly into the tension of the sheet ahead of the calender. Tensiometer control provides for the first time a simple means of compensating for all these variables and controlling paper tension directly. It opens the way for control of paper tension ahead of size presses and dryers as well as calenders and reels.

Without a paper tensiometer, it is necessary for a machine tender to watch the sheet and pat the moving sheet with his hand frequently to feel tension and adjust speeds when and where he feels it is necessary. Another machine tender may disagree and readjust. Little is known about how much the tension varies from day to day or how much it varies between operators. It is purely personal judgment. The paper tensiometer permits assigning a number to the tension and can indicate and control tension continuously with greater precision and uniformity than humanly possible.

Features of the tensiometer

The paper tensiometer is made up of two components, the tension head and the power unit.

The tension head includes a small roller approximately 4 inches in length mounted on ball bearings and attached to a short stiff leaf spring. This roller is pressed lightly into the moving sheet. Changes in paper tension change roller position a slight fraction of an inch. This changes the air gap of a magnetic structure wihch emits an electric signal proportional to the tension.

The power unit contains the metering circuit, indicating instrument and operator's controls when used for automatic regulation. The scale of the indicating instrument is marked in arbitrary units from 0 to 100. The instrument can be calibrated by the mill on a specific installation in absolute units of pounds per inch if desired.

The entire equipment is well protected and sturdily constructed to withstand conditions normally encountered in a paper mill.

When used for control purposes, the tensiometer output can be applied and adjusted to operate directly into standard electronic circuits used with G-E paper machine regulators. An operator's adjustment is available on the panel for adjusting tension. A switch is provided to permit switching the tension circuit in or out of the standard speed regulator. When used in this fashion, the operator has available at his discretion either conventional speed control or paper tension control at the snap of a switch. Switching can be done with the sheet on the machine, if properly adjusted.

The equipment can be applied to lightweight paper machines as well as paperboard machines. An adjustment permits setting the leaf spring stiffness in steps to select one of several tension ranges available from approximately 3 lb. per inch full scale deflection to 16 lb. per inch full scale deflection. After this adjustment is determined initially, then a range of paper tensions of 6 to 1 or more can be accommodated by manipulation of the tension rheostat.

The paper tensiometer is a new development for the paper industry. It provides a much needed means of measuring and regulating true tension on a paper machine. It is an outstanding contribution to the art of operating and controlling paper machine drives. Experience gained during pre-production field trials together with almost one year continuous operating experience with standard production units on various machines ranging from board to tissue at speeds from 100 to 1500 Rpm. testifies to the effectiveness and reliability of this new method of control.

Flambeau improvement program

Continued from page 1054

and the change will be completed early in 1953.

The new Westinghouse generator will be horizontal, directly connected to a 650 hp. Leffel water wheel. It will have 500 KVA capacity at 80 per cent power factor. The speed will be controlled by a Woodward governor. The new generator will have ample protection with a Westinghouse starter and metal clad breaker cubicle. Some alterations will be made in the present building, and an enclosure will be built to protect the generator from adjacent grinder operation.

The new generator will take full advantage of available water power, but it will not cut the mill's groundwood capacity. It will insure trouble free operation of the paper machines, necessary water pumps, and other auxiliary equipment to prevent shut downs due to electrical trouble.

Abundant markets create opportunity for establishing a...

Cellophane Industry in the West

Part III in a series of three articles outlining how a cellophane industry can be developed in the West. Available raw materials and plant locations were discussed in the October and November installments.

WILLIAM C. McINDOE
Consulting Industrial Chemist

AVAILABLE MARKET of adequate size is the most important consideration in the location of a plant site. Out here in the eleven Western States it is believed that the bulk of the cellophane consumed is for wrapping dry goods and food products. Inquiries of the major department stores disclosed that almost all their cellophane wrapped dry goods originated outside of the area and were wrapped at the source. Therefore for the purposes of this feasibility study the Western food industries were interrogated as to their present consumption of cellophane and as to how much cellophane they would use if they could get it, since they are struggling under short supplies now.

How big is this Western food industry as represented by bakers, meat packers, candy manufacturers, nut packers and packers of dry and frozen fruits, vegetables, meats and seafoods?

For the past seven consecutive years the agricultural and food industries of the three Pacific Northwest states of Washington, Oregon, and Idaho alone have earned over one billion dollars annually.

The 878 commercial bakers in the West (13 per cent of the U.S. total) grossed nearly $436 million in 1949 in producing 18 per cent of the nation's bakery items (19).

Western meat packers are doing about 15 per cent of the national pack (20).

The West has 100 per cent of the nation's production and pack of almonds, filberts and walnuts which is over 70 per cent of the nut harvest (21).

Western candy manufacturers produced 14.9 per cent of the national total in 1949 representing average per capita sales of 21.2 pounds and better than 42 per cent of the value of the total national sales (22).

Of the nation's 1949 pack of frozen vegetables the West produced 50 per cent of the asparagus, over 60 per cent of the lima beans, snap beans 33 per cent, corn 50 per cent, peas 65 per cent, pumpkin over 50 per cent, broccoli over 75 per cent, Brussell's sprouts 100 per cent, cauliflower over 90 per cent, and spinach 30 per cent. The West packed nearly 72 percent of the nation's 1949 production of frozen berries and nearly 45 per cent of the other frozen fruits; also, 27.6 per cent of the nation's frozen seafood pack.

In 1949 the West packed nearly 97 per cent of the U.S. production of dried edible peas and over 58 per cent of the dried edible beans (23).

In attempting to ascertain the present and potential sizes of the cellophane markets in the Western food industries, inquiries were directed to trade associations, distributors and known consumers. Wherever possible these were implemented by personal interviews. The results were so divergent that it is believed that the motivation of both distributors (including converters), and consumers must be taken into consideration. Possibly a new and strong organization coming into the field might market independently. On the other hand, consumers severely curtailed in supplies with resultant impairment of markets, packaging programs, expansion, etc., would welcome and desire to encourage increased production particularly in this area, with resultant lower freight rates. Remember that consumers said that curtailment of supplies denied them anywhere from 50 per cent to 75 per cent of desired quantities.

Western cellophane consumption

Owing to short supplies, the vast majority of consumers have chosen to use the light 300 gauge cellophane in order to gain the greatest wrapping coverage per weight. For this gauge the conversion factor used in this study for translating data given in square yards into pounds was 21,500 sq. in. per lb. Consequently consumption figures in this report are given as pounds of 300 gauge. Consumers' statements of curtailment of supplies range from 33 per cent to 75 per cent, with no new customer having much chance of getting any cellophane. Seventy-five per cent seems very drastic; consequently, we believe that ample supplies would double present consumption promptly. Distributors and converters are more cautious in prediction: they seriously doubt that, if supplies were available today in unlimited quantity, usage would be almost immediately doubled. However, they are unwilling to say that it might not increase by 25 per cent.

Bakeries

From the trade associations and publications we get one estimate (a), from personal interviews with many commercial bakers, 60 per cent using cellophane; a second estimate (b), while distributors and converters provided a third figure (c).

(a) According to *Bakers Review*, 878 Western bakers earned $435.7 million gross in 1949 (24)—25 per cent from cakes (100 per cent *cellophane wrapped*) at $0.45 average per cake and 75 per cent from breads (broken down as follows: 65 per cent white @ $0.23 per loaf, 15 per cent wheat @ $0.16 and 20 per cent specialty breads, *cellophane wrapped*, at $0.17½ per loaf).

On this basis and further assumption that 60 per cent of the 878 Western bakers are using cellophane and at 100 sq. in. per cake, 21,500 sq. in. per pound, wrapping cakes required 672,670 lb. Specialty breads at 256 sq. in. per loaf required 2,344,834. Total indicated present use of cellophane by bakery trade 3,017,504. If this consumption represents a 33⅓ per cent curtailment, ample supplies would bring consumption up to 4,023,339 lb. of which 1,005,835 lb. would be the portion not presently under contract. If this consumption represents 50 per cent curtailment the use would double with ample supplies, or 6,035,008 lb., and 3,017,504 lb. would be open to a new supplier. If the present consumption is a 75 per cent curtailment the potential market would be four times that or 12,070,016 lb., of which the portion not under contract would be 9,052,512 lb.

(b) Of the 40 commercial bakeries in Portland 24, or 60 per cent were using cellophane to wrap their goods at 852,290 lb. per year, or 35,512 lb. per baker. Assuming that Western eating habits are similar, then 60 per cent of the 878 Western bakers or 527 are using 527 times 35,512, or 18,714,824 lb. Satisfying a 33⅓ per cent curtailment would increase this to 24,953,099 lb. of which 6,238,275 lb. would not be under contract. Satisfying a 50 per cent shortage raises potential market to 37,429,648 lb. with 18,714,824 lb. not under contract.

Table 6—1949 Consumption of Cellophane for Wrappings in the Food Industries of the Eleven Western States. (Annual Consumption in Pounds)

	Actual Consumption under Drastically Curtailed Supplies	Potential Consumption with Ample Supplies and Potential Market Available to a New Producer							
		Potential Consumption with Ample Supplies				Immediate Market for New Producer equals Increment due to Ample Supplies when available			
		From curtailment of 25%	33 1/3%	50%	75%	From curtailment of 25%	33 1/3%	50%	75%
	I	II	III	IV	V	VI	VII	VIII	IX
Bakery Trade –									
(a) Calculated from $435 million gross earnings of 878 western bakers. (60% using cellophane)	3,017,500		4,023,340	6,035,010	12,070,020		1,005,835	3,017,500	9,052,510
(b) Per baker use in Portland x 527 (60% of 878)	18,714,820		24,953,180	37,429,650	74,859,300		6,238,275	18,714,820	56,144,470
(c) Estimate of Distributors and converters (Pacific Coast)	13,475,860	16,844,825		26,951,720		3,368,965		13,475,860	
Meat Packers –									
(a) Per capita use in Portland x Population 11 Western States	54,242,040		72,322,720	108,484,080	216,968,160		18,080,680	54,242,040	162,726,120
(b) Estimate of Distributors and Converters (Pacific Coast)	3,365,000	4,206,250		6,730,000		841,250		3,365,000	
Candy Manufacturers –									
(a) Per capita use in Portland x Population 11 Western States	5,347,620		8,021,430	10,695,240	21,390,480		2,673,810	5,347,620	16,042,86
(b) Estimate of Distributors and Converters (Pacific Coast)	2,690,000	3,362,500		5,380,000		672,500		2,690,000	
1949 Dry Food Pack –									
(a) In 1-1½ lb. Pkgs. only (80% in cellophane)	13,442,420		20,163,630	26,884,840	53,769,280		6,721,210	13,442,420	40,327,260
(b) Estimate of Distributors and Converters (Pacific Coast)	10,760,000	13,450,000		21,520,000		2,690,000		10,760,000	
1949 Frozen Food Pack –									
(a) In 1-1½ lb. Pkgs. only (80% in cellophane)	2,384,770		3,577,155	4,769,540	9,539,080		1,192,385	2,384,770	7,154,310
(b) Estimate of Distributors and Converters (Pacific Coast)	2,017,240	2,521,550		4,034,480		504,310		2,017,240	
Miscellaneous – (Including Wrapping of Fresh Produce)	7,800,000	9,250,000		15,600,000		1,450,000		7,800,000	
Total Western Consumption and Market for Cellophane									
(a)	78,434,350		108,108,270	156,868,710	313,737,020		29,673,920	78,434,350	235,303,060
(b) (a) plus Bakery (b)	94,131,670		129,038,030	188,263,350	376,526,300		34,906,360	94,131,670	282,395,020
(c) Estimate of Distributors and Converters (Pacific Coast)	40,108,100	49,108,100		80,216,200		9,527,025		40,108,100	

Satisfying a drastic curtailment of 75 per cent brings the market to 74,859,296 lb. of which a new plant could supply 56,144,472 lb.

(c) According to converters and distributors, consumption on the Pacific Coast (74 per cent of the population of the 11-Western States) is about 10,000,000 lb.; therefore the consumption in the 11-Western States would be 13,475,860 lb. These people believe that ample supplies would almost immediately increase the market by upwards of 25 per cent, or 3,368,965 lb.; but are unwilling to estimate that the market would double, thus increase by 13,475,860 lb.

Meat packers

(a) In personal interviews, local packers stated that they are using 1,031,370 lb. of cellophane annually for wrapping meats (including 396,000 lb. for self-service and 102,875 lb. for sausage casings). This consumption represents 2.78 lb. per capita per year; therefore consumption in the 11-Western States is calculated to be 54,242,040 lb. Lifting a 33⅓ per cent curtailment, makes the potential market 72,322,720 lb., of which 18,080,680 lb. could be available for contract. Lifting a 50 per cent curtailment, brings the potential market to 108,484,080 lb. with 54,242,040 lb. available to new producers. Lifting a 75 per cent curtailment, brings potential market to 216,968,160 lb. with 162,726,120 lb. available to new producers.

(b) Distributors and converters report cellophane wrapping of meats on the Pacific Coast to be about 2,500,000 lb.; therefore, in the 11-Western States about 26 per cent more, or 3,365,000 lb. According to their prediction, ample supplies would increase consumption almost immediately by 25 per cent or 841,250 lb. and if it doubled an additional 3,365,000 lb. would be consumed. In view of the reported use of over 1,000,000 lb. in the Portland area alone these figures seem very low.

Candy manufacturers

(a) Local candy manufacturers stated that they were consuming 101,685 lb. of cellophane annually or 0.2741 lb. per capita. On the assumption that all our Western people had similar appetites for candy, the Western market for cellophane for wrapping candy was 5,347,620 lb. annually.

If this represents a curtailment of

33⅓ per cent, then the potential market becomes 8,021,430 lb. of which 2,673,-810 lb. might be available to a new producer.

Similarly, filling a 50 per cent curtailment brings the potential market to 10,-695,240 lb. with 5,347,620 lb. available.

And filling a 75 per cent curtailment brings the potential market to 21,390,480 lb. of which 16,042,860 lb. would be available to a new producer.

(b) Here again the distributors and converters were very cautious with an estimate of only 2,000,000 lb. for the Pacific Coast, making total Western consumption about 2,690,000 lb. Still following their predictions, ample supplies would increase this 25 per cent to 3,-362,500 lb.; but not double or 5,380,000 lb.

Western dry food pack 1949

(a) Published statistics showed that in 1949 the dried fruits, beans, peas, dehydrated fruits and vegetables, almonds and filberts packed in 1—1½ lb. containers amounted to 3,451,400,000 lb. (25). Of this figure 80 per cent was said to have been wrapped in cellophane at an estimated 100 sq. in. per pound package, or 2,761,120,000 lb. so wrapped, utilizing 12,842,420 lb. of cellophane. According to the Walnut Growers Association, they alone used an additional 600,000 lb. of cellophane, bringing the total for the Western dry foods industry to 13,442,420 lb. annually. If this represents a curtailment of 33⅓ per cent the potential market becomes 20,163,630 lb. with 6,721,210 lb. available to a new producer.

Similarly, a 50 per cent curtailment brings the potential market to 26,884,840 lb. with 13,442,420 lb. available to a new producer. And a 75 per cent curtailment sends the potential market to 53,769,280 lb. with 40,327,260 lb. available.

(b) The present consumption figure for dry foods on the Pacific Coast estimated by the distributors and converters is 8,000,000 lb. or 10,760,000 lb. for the 11-Western States. Granted adequate supplies of cellophane their almost immediate increase of 25 per cent lifts the market to 13,450,000 lb. which compares closely with the present consumption figure given by the consumers in (a) above; whereas, the doubling doubted by the distributors and converters would be 26,900,000 lb., again close to the potential market estimated by the consumers on the basis that present consumption represents 50 per cent of their needs.

Western frozen food pack 1949

(a) According to the 1950 Statistical Review Number of *Western Canner and Packer* (26) that portion only of the total pack wrapped in 1—2½-pound packages was as follows:

Fruit pack	195,638,000 lb.
Vegetable pack	317,087,000 lb.
Total	512,725,000 lb.

Again, 80 per cent of this was reported wrapped in cellophane at 125 sq. in. per pound package; therefore the Western frozen food industry used 512,-725,000 × 125 ÷ 21,500 = 2,980,000 lb. According to the consumers, they were seriously curtailed by short supplies in their use of cellophane. If the curtailment amounted to 33⅓ per cent, then ample supplies would almost immediately raise the market to 4,470,000 lb. with the increment open to a new producer. If the curtailment went as deep as 50 per cent then the market doubles, or becomes 5,960,000 lb., with 2,980,000 lb. available to a new producer. If, however, the present consumption represents only one-quarter of what they would use if they could get it, then the potential market is 11,920,000 lb. with 8,940,000 lb. within the market of a new producer.

(b) The distributors and converters estimate that the frozen food industry of the Pacific Coast is using 1,500,000 lb. of cellophane; therefore the eleven Western States would use 2,017,240 lb. They very conservatively estimate that ample supplies would almost immediately increase use by 25 per cent to a total of 2,521,550 lb., with the increment 504,310 lb. being provided by a new producer. However, they doubt the market doubling for a new total of 4,034,480 lb., with 2,017,240-lb. from a new producer.

The distributors and converters added a miscellaneous item, including the wrapping of fresh produce, to their estimate, totalling 4,000,000 lb. for the Pacific Coast, which would be 7,800,000 lb. for the eleven Western States. On the basis of their estimate this figure represents at least a 25 per cent cut which ample supplies would fill almost immediately, but the market was not expected to double.

In deriving the calculated results shown in Table 6, note that actual and potential consumption of cellophane reported by consumers (Lines *a* and *b* under Totals, Columns I-IX), have been compared with similar estimates from distributors and converters (Line *c* under Totals, Columns I-IX). For the bakery trade there is reasonable agreement between *b* of the consumers' estimate and *c* of the distributors and converters. In the case of the meat packers it is difficult to reconcile the extremely low estimate of the distributors and converters, 3,365,-000 lb., with the over 1,000,000 lb. of cellophane reported used by the local meat packers alone. For candy manufacturers the calculation based on consumption in Portland comes out almost exactly double the estimate of the distributors and converters. In the cases of both the dry and frozen food packs there is reasonable agreement between consumers and distributors on the size of the cellophane market.

Conclusions

Depending on whom you are interviewing, the present annual Western consumption of cellophane ranges from about 40 million pounds to 94 million pounds and the potential market up to over 376 million pounds depending on the degree of reaction from drastic curtailment due to short supplies. A consumption of 94 million pounds, or about 31 per cent of the estimated national production, does not seem too far out of line for an area in the billion dollar class producing from 30 per cent to 100 per cent of the national frozen food packs; 58 per cent to over 97 per cent of dry foods; doing 18 per cent of the baking; 15 per cent of the meat packing and over 42 per cent of the value of the national candy pack, etc.

After weighing all the testimony collected it is our belief that present supplies of cellophane are short from 33⅓ per cent to 50 per cent and that, granted ample supplies, Western consumption in the fields studied would surely be half again as much or 129 million pounds and possibly double, or 188 million pounds.

Of this increased consumption it is believed that the increments, about 35 million pounds to 94 million pounds, would be beyond present contracts and thus available to a new producer.

Eventually, the pressure of lower freight rates, (the Nation's railroads are presently petitioning for an additional 15 per cent hike in freight rates straight across the board), should give the Western producer the rest of the market as rapidly as present contracts with Eastern producers run out.

Consequently it is believed that the Western markets discussed in this report are big enough and stable enough to provide a prosperous market for a Western plant to manufacture cellophane under licenses from E. I. du Pont de Nemours & Co.

References

(19) Letter, Bakers Review, dated Oct. 26, 1950.

(20) Private Communication.

(21) Western Canner & Packer, 1950 Annual, p. 197.

(22) Confectioners Journal, Vol. 77, #912, Jan. 1951, pp. 44-46.

(23) Western Canner & Packer, 1950 Annual, pp. 157, 163, 169, 211.

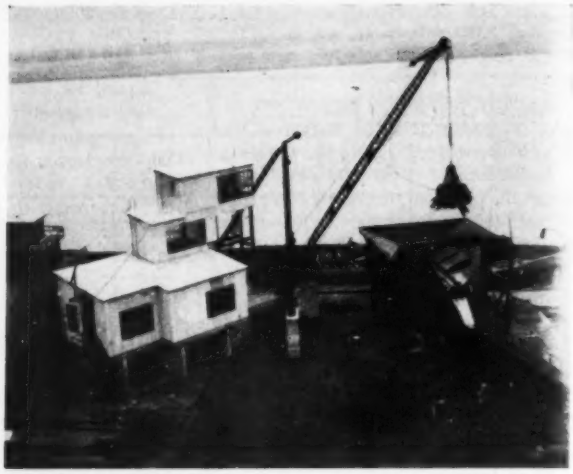
(24) Ltr., C. W. Webster, Editor Bakers Review, dated Oct. 26, 1950.

(25) Western Canner & Packer, Statistical Review and Yearbook Number, Vol. *42*, No. 7, April 25, 1950, pp. 197-213, 221-222.

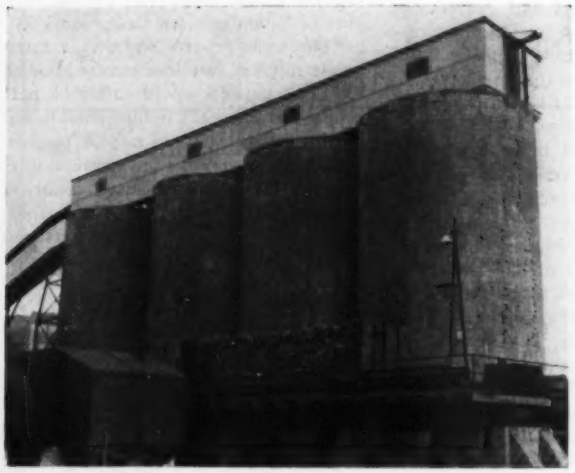
(26) Western Canner & Packer, Statistical Review and Yearbook Number, Vol. *42*, No. 7, April 25, 1950, pp. 153-171, 223-224.

Chesapeake expansion—wood handling

CONTROL TOWER operator can see all wood handling operations

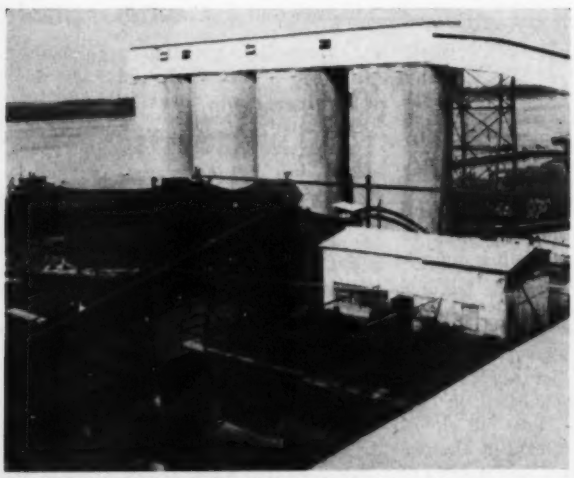


BARGE UNLOADER (American Hoist & Derrick)—bulk of wood is brought in by barges

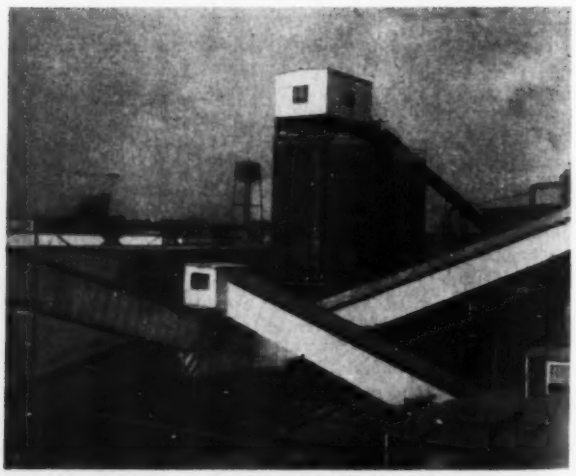


GANTRY CRANE and belt conveyor in wood storage area

PULPWOOD cars are unloaded into conveyor



FOUR CHIP SILOS (Neff & Fry); barking drums in foreground



CHIP CONVEYOR transfer point; two high density stock storage tanks (back)

New ideas find practical application as

Chesapeake expands to 500 tons

- Flash drying system for lime mud recovery
- Suspension burning of bark and wood waste
- Pressure washing of brown kraft stock
- Installation of Ross convection-type pulp dryer
- Wood handling system

By RICHARD W. PORTER

ORIGINALLY BUILT as a sulphate pulp mill in 1913, the Chesapeake Corp. plant at West Point has, over the years, experienced constant changes in keeping pace with technological developments and economic demands. Modernization and expansion, however, forged ahead in the postwar years; and as a result of this program, the plant has increased its output to some 500 tons per day of unbleached sulphate pulp, of which 150 tons are market pulp and 350 tons are made into paperboard and other kraft papers.

In common with older mills, however, expansion is not just simply adding extra units alongside the old but there is a constant problem of how to fit new equipment into space available. Because of such problems and because Chesapeake management has habitually taken the lead in trying new ideas, the company has many "firsts" to its credit. As a result, it is one of the most modern kraft mills in the country. No single department of the mill has been left out in the improvement program. In this report, however, we can only hit the high spots, covering major installations of the past few years.

Wood handling and processing

Wood for this mill is largely obtained fairly close to the shores of Chesapeake Bay and in the area west of Richmond. Wood is brought to the mill by three different means—namely: railroad, trucks and barge. The company has numerous landings on Chesapeake Bay, and the wood from adjacent areas

M. C. McDonald

S. G. Olsson

Erik Zimmerman

Henry Vranian

Facts about Chesapeake Corp.

THE COMPANY

Founded in January 1913, the Chesapeake Pulp and Paper Co. began manufacture of pulp in early 1914. In 1917 a cylinder board machine of 25-ton capacity was added.

In 1918 the Chesapeake Corp. was formed and purchased the entire properties of the Chesapeake Pulp and Paper Co., including 2,654 acres of timber land owned in surrounding counties. At this time the mill had a daily capacity of 50 tons of pulp and cylinder board.

In 1929 the present 242-inch Pusey & Jones fourdrinier machine was erected.

The company now owns 115,000 acres of timber land and has a mill producing over 500 tons of pulp, paper, and board per day.

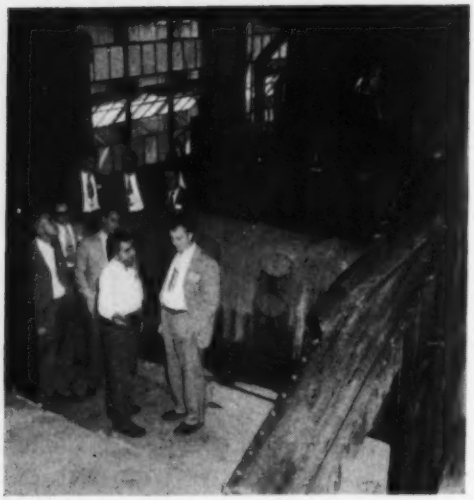
THE MEN

Moving figure behind the company is Elis Olsson, who with several other farseeing men, purchased the company in 1918. A chemical engineer and a pioneer in sulphate pulping, he received his education in Sweden and worked in mills there and in Canada before coming to West Point. He is now chairman of the board.

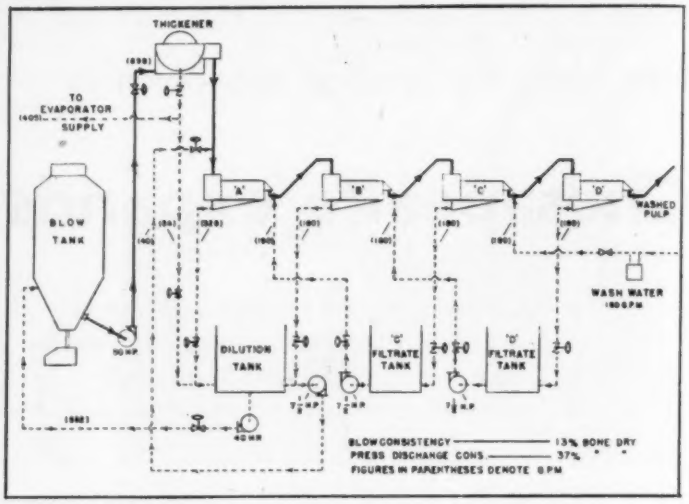
M. C. McDonald, formerly with the Brown Paper Mill Co., Monroe, La., is president and general manager. He has been largely responsible for some of the recent developments at Chesapeake. He came with the company in 1945. Other officers of the company are W. C. Gouldman, vice president, secretary, and sales manager; Sture G. Olsson, vice president in charge of manufacturing; and O. D. Dennis, treasurer.

Operating executives include: Erik Zimmerman, general superintendent; Henry Vranian, research director and chief chemist; E. M. Dozier, pulp mill superintendent; Harry F. Reick, paper mill superintendent; Robert Ellwanger, power plant superintendent and chief engineer.

Chesapeake expansion—pressure washing



PRESSURE WASHERS (Sutherland)—Henry Vranian explains operation to visitors



FOUR STAGE pressure washing system for brown stock

is brought to the landings by trucks. Most of the wood is stored at the landings and is brought to the mill by barge as needed.

The company has five barges, each of which holds up to 500 cords. They consist of regular ship hulls open at the top, which are brought to the mill by tugboats. Barges are unloaded by two stiff-leg derricks at the mill, using orange peel or other types of grapple buckets. They drop the wood into conveyors which take the wood into barking drums or to yard storage. Wood that is trucked into the mill is unloaded by means of a large Gantry crane which can discharge either to a conveyor or to yard storage.

Wood brought in by rail cars is unloaded manually into a conveyor. A relatively small amount is brought in this way.

Stiff-leg derricks, or barge unloaders, are American Hoist and Derrick Co. units. The Gantry crane was made by the Merriam Steam Shovel Co. It has a 37-ton capacity. Yard storage capacity for wood is about 8000 cords.

The whole wood-handling system has been almost completely renovated and rebuilt. Link-Belt conveyors and Goodyear belts are used for the most part. The wood yard operations are handled from a control tower standing in the middle of the wood yard. The operator can see the operation of the two barge unloading cranes, the Gantry crane, the barking drums and the whole wood conveyor system. He has a push-button panel that controls all the conveyors, and he can communicate with other operators in the wood yard, wood room, etc.

Wood is barked in two Fibre Making Processes drums of the suspended chain type. They operate in parallel. Barked wood is fed through a 24-inch spout to a new 12-knife 96-in. diam. Carthage chipper driven through a flat belt by a 400 hp. induction motor. It is equipped with card breakers, which break up any large chips. Two shifts of the wood room with the single chipper provide enough chips for full 24-hr. production of the pulp mill.

Chips go either to the digesters or to four new Neff and Fry chip silos. Each of these is 30 ft. in diam. 53 ft. high to the bottom of the cone, and holds 30,000 cu. ft. or enough chips to make 80 tons of pulp. The four chip silos will hold enough chips to operate the pulp mill two shifts at full capacity.

Pulping

Pulp is cooked in 11 digesters. Four new digesters are of 2300 cf. capacity. All of the new digesters are Blaw-Knox and are equipped with Yarway blow valves. Bristol instruments are used to measure the temperature and pressure in the digesters. Some of the new digesters are loaded direct from a belt conveyor, and the rest have overhead chip hoppers. Plans are to replace all chip hoppers with the belt conveyor loading system. From the digesters, the pulp is blown to two parallel blow tanks, the second of which was built in 1949.

Heat is recovered from the digester blow steam by American Heat Reclaiming Co. cyclone condenser. Instead of using a single accumulator tank, four old diffusers are hooked up in series, with the bottom of one connected with the top of the next one. Water from the accumulator is also used in an indirect heat exchanger for heating fresh water.

Pressure washing of kraft pulp

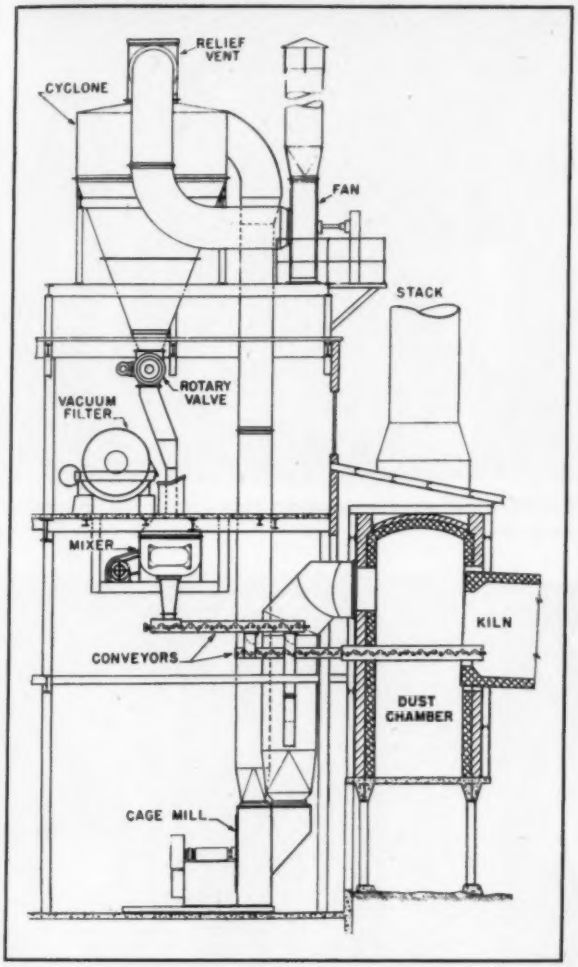
One successful departure from traditional methods of washing kraft pulp (diffusers and rotary vacuum washers) is Chesapeake's application of pressure washing.

Two lines of Sutherland pressure washers, one with four presses and one with three, provide multi-stage washing of brown stock. Each pressure washer consists of a screw or worm, the trough area of which diminishes uniformly toward the discharge point, while the flanged diameter remains constant. The screw or compression element (about 11 ft. long) rotates in an 18-inch diam. perforated cylinder with a minimum clearance, and designed so that pulp does not rotate with the screw but tends to move in a straight line parallel with the axis of the screw toward the discharge point. A definite volume ratio exists between the feed and discharge so that the force or pressure exerted is controlled within desired limits.

Tonnage throughout is dependent on the rpm. of the compression element. While one set of presses was equipped with a variable speed drive, it has been found that once the optimum feed is established, there is little reason to change, since adequate storage takes care of changing demand of the paper machine and pulp dryer.

In operation (as shown in the flow diagram) brown stock from the blow tank is pumped at 5 per cent consistency to an underflow Valley thickener discharging 11 per cent consistency stock to the chute feeding the first or A press. Here a small amount of B press filtrate is added (controlled by the load on the screw press drive) as a final consistency adjustment. Stock discharges from A press at about 37 per cent consistency, is repulped with C press filtrate as it drops into the inclined screw connveyor going to the B press. Each succeeding stage

–flash drying of lime mud



FLASH DRYING system (Combustion Engineering) increases capacity and efficiency of lime recovery operations

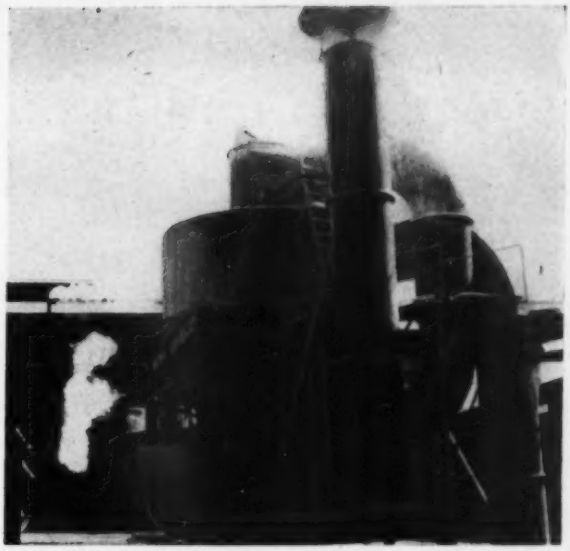
operates in the same manner, with the final washed stock being conveyed direct to the high density storage tank.

Filtrate from the thickener and from each of the presses is retarded by a level control valve to reduce air entrainment and foaming tendencies. The entire system is closed with wash water being added ahead of the last press for repulping. Tail water from the screen room heated to about 200 F is used. Since only a small amount of water is used, there is less dilution of evaporator feed, and high wash water temperature permits more efficient blow heat recovery and sends hotter liquor to the evaporators. Since high consistencies are employed, filtrate volumes are small, requiring smaller tanks, pumps and piping than ordinarily used.

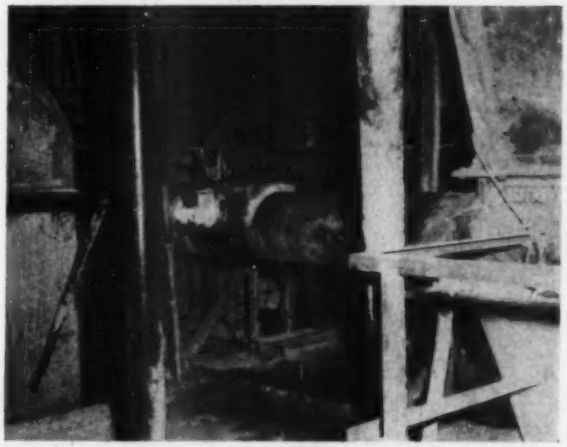
Flash drying of lime kiln feed

Because pulp capacity had been more than doubled since the rotary lime kiln was installed in 1935, it finally became necessary for Chesapeake to either install a second kiln or augment the capacity of the old kiln. Space limitations required any second kiln to be located remote from the existing lime recovery operations.

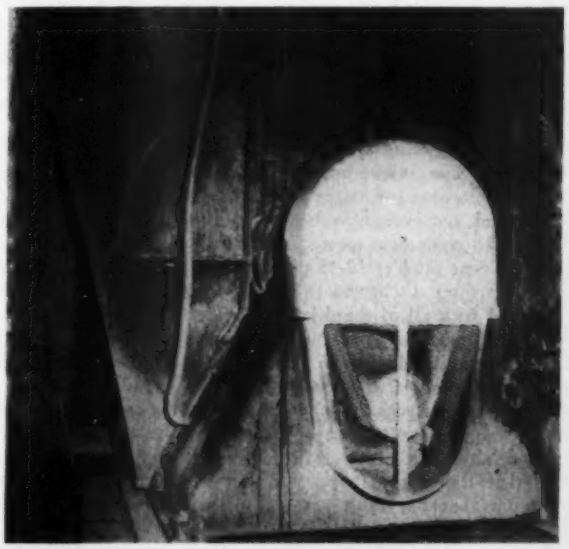
The old kiln had never been equipped with a chain section and considerable heat was lost to atmosphere in the stack gas. This suggested the application of flash drying to the lime mud, utilizing heat from the stack gas to step up the capacity of the kiln, improve heat recovery and lower fuel consumption.



CYCLONE separates flash dried carbonate from air

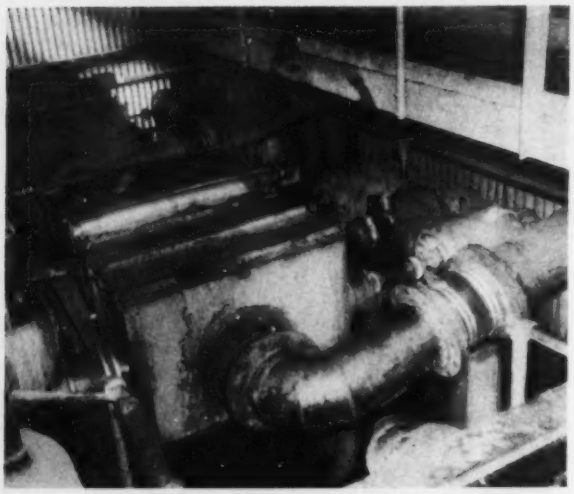


DRIED CARBONATE and wet lime mud are blended in mixer (center rear); hot gas duct to cage mill (left), wet mud by-pass (right) and kiln feed screw



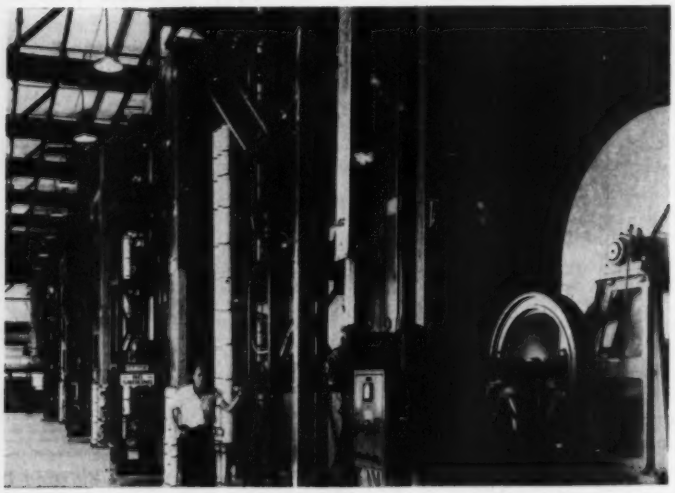
CAGE MILL in which flash drying takes place

Chesapeake expansion—pulp drying

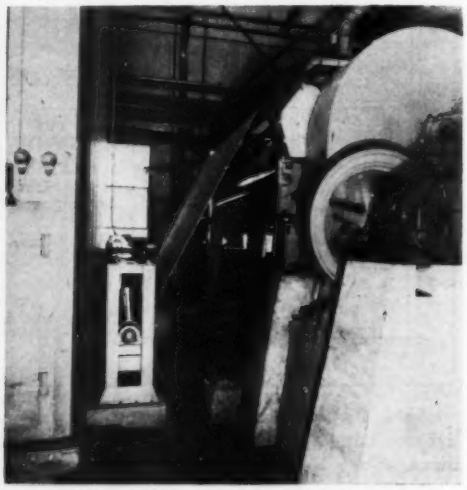


PULP SCREENS (Bird Vibrotor) ahead of wet machine

KAMYR wet machine (Sandy Hill) forms 120 in. wide pulp sheet



CONVECTION-TYPE pulp dryer (J. O. Ross Eng. Co.) designed for 125 tons per day



DRY PULP emerges from bottom pass of dryer to the cutter

Experimental work substantiated the belief that flash drying would be feasible, and early in 1951 a flash drying system built by Combustion Engineering and Superheater, Inc. was installed.

The flash drying system was installed at the feed end of the rotary kiln, where hot gases could be readily drawn from the plenum chamber of the kiln stack. It requires only a small floor area, but extends vertically from the ground floor to the roof with equipment located at different floor levels.

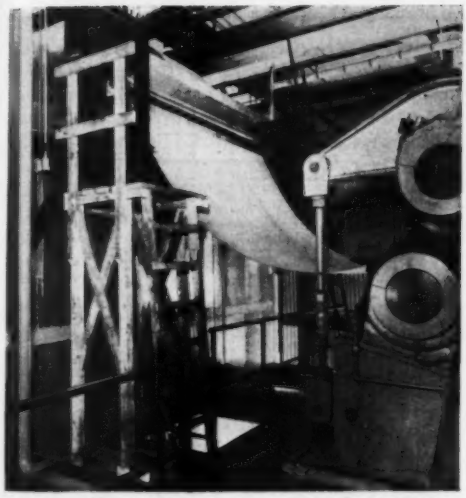
Wet lime mud at 30-35 per cent moisture from the rotary vacuum filter discharges to a mixer, where it is thoroughly blended with all of the dried carbonate from the flash dryer. From the mixer, a screw conveyor transfers the moist material over an adjustable slide gate, through which a regulated portion at 8-10 per cent moisture drops to the kiln feed screw. The remainder goes to a chute leading to the cage mill, where actual drying takes place. The cage mill essentially comprises a special enclosed rotor, which provides maximum agitation, so that the wet material and hot gases are brought into intimate contact. Both gas and dried carbonate are blown upwards to the cyclone (on the roof) where the dust is collected and fed to the mixer. Spent gas is drawn from the top of the cyclone by a vent fan and discharged to the atmosphere at 150 F.

It is essential that the kiln feed be moist enough so that it will stay in the kiln and not blow back. Since the operator has only minor control of the amount of filter cake, moisture in the kiln feed is controlled by the slide gate in the mixer discharge screw. If the kiln feed is too dry, the gate is opened further, reducing the feed to the dryer, which in turn reduces the amount of dried product that is mixed with the wet mud from the filter, which then increases the moisture of the kiln feed. This regulating process is reversed if the kiln feed is too wet. In practice the adjustment remains unchanged for many days at a time.

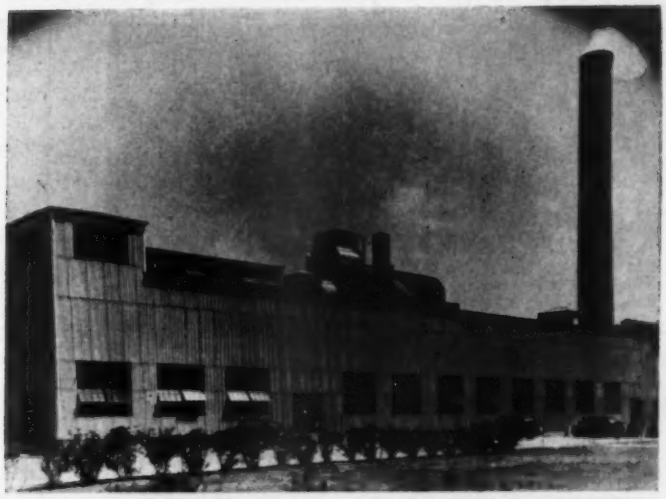
As a result of incorporating a flash dryer in the lime recovery system, the kiln capacity has increased by 40 per cent, fuel consumption per ton of reburned lime reduced by 38 per cent and make up lime per ton of pulp reduced by 37 per cent.

High density storage

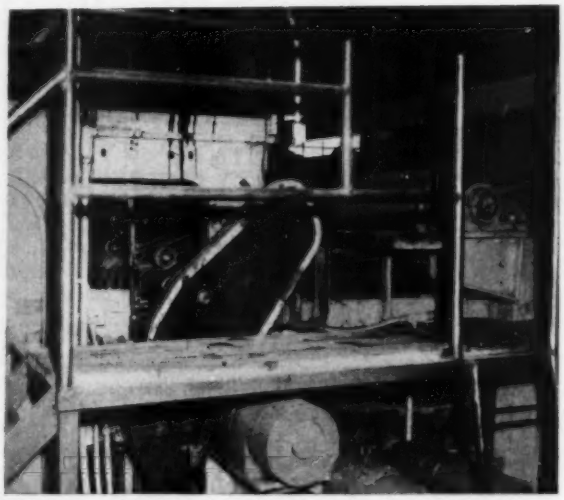
Two high density stock storage tanks have extended the stock storage capacity. One of these is used for screenings at



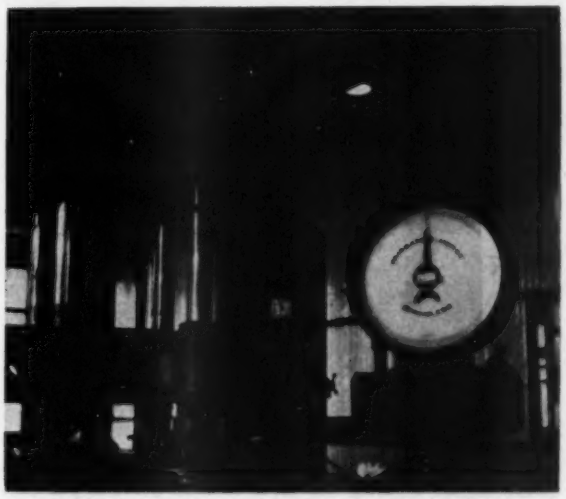
PULP SHEET from second press enters top pass of dryer



ECONOMIZER on roof recovers heat from dryer exhaust to achieve high thermal efficiency



CUTTER and layboy (Hamblett) cuts pulp web into sheets



STACKED sheets are weighed on scale (Fairbanks-Morse), transferred on roller conveyor (Matthews), pressed and baled in a Baldwin press

10 to 12 per cent consistency, and contains about 100 tons B.D., while the other one contains washed stock at 20 to 22 per cent consistency, and holds about 200 tons B.D. Washed stock is conveyed to the top of the storage tank. Screenings at low density are pumped to a vacuum cylinder and dewatered at the top of the storage tank. The high density storage tanks are equipped with a paddle agitator and a torque-type consistency regulator, very similar to that used in a blow tank. A ring of nozzles at the top of the cone prevents pockets of stock from lodging and spoiling, and an extra ring of nozzles is located about halfway up the cone bottom, to aid in sluicing out the high density stock.

These high density storage tanks have been of real benefit, since the pulp mill can now run at an optimum schedule because of an increased surge capacity between the pulp mill and the paper mill.

The outside of the tanks are protected with Erkote, provided by the Earl Paint Co. This is applied by spraying on the outside, and protects tanks against corrosion by mill fumes. While this coating process is rather expensive, the company plans to coat all outside steel structures to prevent corrosion damage.

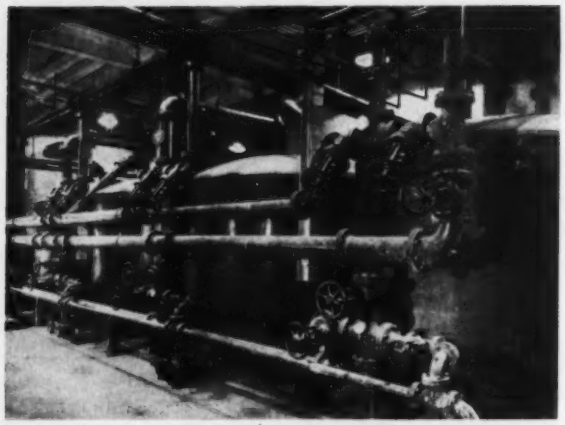
Pulp Drying

While the primary product at Chesapeake is paperboard, the mill also produces market pulp. Pulp from the screens is first pumped through a battery of three Bird Vibrotor screens installed on a mezzanine ahead of the wet machine. Rescreened pulp is formed into a sheet on a Sandy Hill built Kamyr cylinder wet machine, which includes a first press, two preheated drying cylinders followed by a second press. From the second press, the sheet of pulp enters the multipass air dryer.

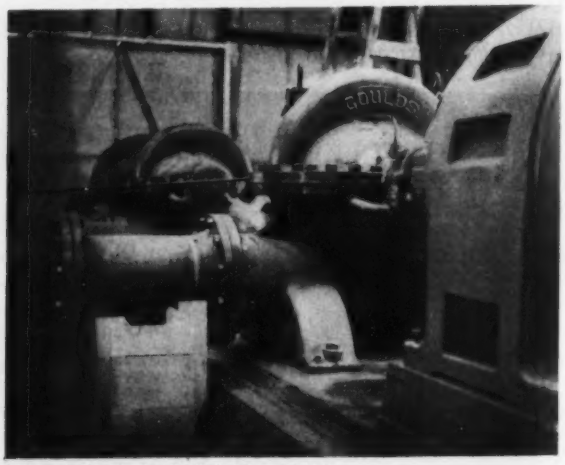
When the dry pulp leaves the Ross dryer, it goes into a Hamblett cutter, and sheets are transferred on a Matthews roll conveyor to a Baldwin press, where the stacks of sheets are baled. Bales of pulp continue on the roll conveyor onto a roughened belt conveyor, which takes them down an incline of about 45 degrees. When the bales get to the bottom of the incline, they go into a roller conveyor again, from which they are picked up by a Clark fork lift truck with accordion-type grabs.

First of the new J. O. Ross Engineering Corporation convection-type pulp dryers to be installed and operated on a commercial scale, the unit at Chesapeake was designed for

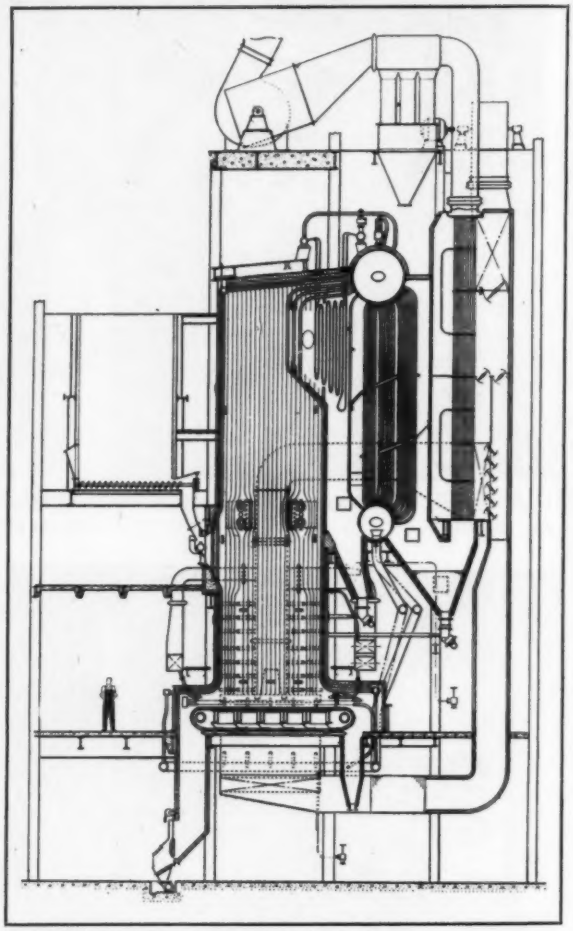
Chesapeake expansion—suspension burning of bark



PRESSURE FILTER (Permutit) feedwater treating system



SALT WATER PUMPS (Goulds) for evaporator condensers



BARK BURNING BOILER (C-E)—high set spreaders and numerous air jets provide suspension burning of bark

125 tons of pulp per 24 hours. The width of the pulp web is 120 inches. Entering the dryer, it is 50 per cent bone dry and leaving the dryer, it is 90 per cent bone dry. Speed range is 40-100 fpm. Steam pressure to the heating units in the dryer is 5-200 psi.

The pulp web enters the dryer at the top and is carried through nine passes on individual variable speed drive cross bar conveyors. Air cooled vestibules at each end permit manual threading at the start up. To prevent undue tension on the web during drying, it passes over a dance roll at each turn-around. The dance rolls are sensitive to tension and are hooked up to the speed control mechanism of each consecutive cross bar conveyor.

Finned type steam heaters heat the air, which is uniformly distributed by headers covering the entire length and width of the dryer. Air flow from the headers is downward, and both sides of the pulp are blasted by the hot air stream.

High thermal efficiency is achieved by taking the wet moisture-laden exhaust air through an air and water economizer. All make up air is preheated by the economizer, and auxiliary steam coils bring the air temperature up to that of the dryer. Fresh air is filtered and enters the dryer at its lowest and dryest pass, while exhaust is taken from the top pass, thus providing counter-flow drying operation. An automatic dew point controller regulates the exhaust volume to maintain desired drying conditions.

Internal catwalks provide access to all internal components of the dryer. This ready accessability makes for easy cleaning and maintenance.

Suspension burning of bark refuse

While bark and wood refuse has always been used as boiler fuel at Chesapeake, a new type of bark burning unit was developed and installed with operation starting in 1951. Built by the Combustion Engineering-Superheater, Inc., the new unit was designed for suspension burning of bark refuse with high set spreaders and the employment of extreme furnace turbulence. It replaced an old Dutch-oven type furnace.

The new unit is rated at 100,000 lb. steam per hour and 600 psi, and as shown in the diagram, is of two-drum design having water-cooled furnace walls. The four high set spreader units are mounted 17 feet above the travelling grate.

Air at 500-550 F. from the tubular heater is introduced through seven rows of tangential nozzles in each side wall with direction of rotation being reversed in alternate rows. Component forces of the jets have the effect of creating turbulence in the furnace. Bark that doesn't burn in suspension (about 15 per cent) distributes fairly uniformly over the entire grate surface.

Coal and oil may both be used as fuels in addition to bark and wood waste. If coal were used, it would be delivered to the fuel hopper by an extension of the coal conveyor that feeds the coal-fired power boilers. Four oil jets are located in each side wall with an air jet between each group of two oil burners.

Cinders and fly ash are recovered and reinjected. Automatic steam exhausters reinject material from the tubular dust collector and the four pass hoppers into a low turbulence

area where unburned carbon is deposited on the grate. Entrained sand is carried forward on the grate to the ash pit.

Before being fed to the furnace hopper, bark and wood waste pass through two Mitts & Merrill hoggers to provide the size reduction necessary for suspension burning. Incorporated in the hogger feed conveyor is an electromagnet for removing tramp iron.

Performance tests over several months indicate substantial savings in fuel costs as well as a reduction in direct operating labor and reduction in maintenance costs. The C-E boiler employs Fairfield Engineering Co. fuel hoppers and conveyors, Buell fly ash collectors, United Conveyor ash handling system and Sturtevant fans. An Electric Machinery Mfg. Co. magnetic coupling is used on the main blower.

Chemical Recovery

Black liquor is evaporated in the Swenson evaporator units. Several of these have been lengthened, but no new ones have been added.

Two Combustion Engineering-Superheater, Inc. recovery furnaces are employed. The oldest one was installed in 1940 and was the first successful spray-type unit to burn the black liquor from more than 300 tons per day of pulp. The latest recovery furnace was installed in 1948. Each of the units can handle 600,000 lb. of solids per day. Two electrostatic precipitators are used after the recovery furnaces. The first one, installed in 1940, is a Research Corp. unit, while the newest one, installed in 1948, is a Koppers unit. A new 250 ft. Heineke stack was built for the powerhouse and recovery furnaces.

Water

Water for the mill is provided by 11 wells 250-800 ft. deep. Two of these are new and were dug by Layne. Actual usage of fresh water at the mill and including turbine condenser water is 15,000 gal. per ton of product. The company is planning on extensive installations of water meters to try to cut down water waste.

Feed Water Treatment

Feed water for the boilers is treated in a new Permutit system. The raw well water is low in hardness, high in sodium alkalinity and high in silica content.

The silica is removed by the cold magnesia process after which the sodium salts and residual hardess are removed by the ion exchange demineralization process, the equipment used being designed for a flow rate of 500 gpm. The silica removal is effected in a Spaulding Precipitator, and the effluent flow to a clear well and from there, through a battery of four pressure type filters to a recarbonation basin. Wash water from the filters is recovered in a wash water reclaimer and returned to the precipitator. Recarbonation is effected with the scrubbed flue gas from an oil burner.

The recarbonated effluent is then passed through two hydrogen zeolite pressure type units, which remove the cations of sodium, calcium and magnesium.

Effluent from the hydrogen zeolite units then passes through two De-Acidite units which remove the sulphate and chloride anions. Carbon-dioxide is removed by a counter-current of air in two wood degasifiers. From the degasifiers, water is pumped to a 55,000 gallon storage tank.

A new salt water pumping station has been built. Two 7000 gpm., 120 ft. head Goulds pumps are used. Salt water will be used as condensing water for the evaporators. One pump handles the work, and one is for a spare. It will also be used for fire protection to the woodpile. The water is pumped through 14-in. lines in a system containing seven O.I.C. 14-in. gate valves. A Link-Belt travelling screen is installed at the salt water inlet.

Acknowledgement

Acknowledgement is made to M. C. McDonald, president and general manager of Chesapeake Corp., for permission to prepare and publish this article. Particular thanks are due Henry Vranian, Erik Zimmerman, and Sture Olsson for their help and cooperation in the preparation of this article.

Further details on some of the new developments can be obtained from such TAPPI papers as *Flash Drying Lime Kiln Feed* by Henry Vranian, Chesapeake Corp. and Robert D. Nickerson, Combustion Engineering-Superheater, Inc.; *Suspension Burning of Bark Refuse* by R. Ellwanger, Chesapeake Corp.; *Pressure Washing of Kraft Pulp* by Erik Zimmerman and Henry Vranian, Chesapeake Corp.; *Continuous Drying of Pulp by Convected Air* by J. F. Gschwind, J. O. Ross Eng. Co.

Align shafts, not couplings

(*Continued from page* 1050)

Although there are two types of misalignment, the trouble usually is a combination of both. Fig. 2 shows both of them:

1. Parallel or offset misalignment; shaft axes are parallel, but do not intersect.
2. Angular misalignment; shaft axes intersect, but shafts are not coaxial.

Where these two conditions of misalignment occur, two distinct sets of measurements are needed to determine and to correct misalignment. These measurements may be taken in the various ways shown in Fig. 3, depending on conditions and the accuracy desired.

Usually one set of axial and radial measurements is taken at quarter turn intervals of the shaft. For rigid couplings, axial measurements should be taken at four circumferential locations for each position in order to check the accuracy of the coupling faces, i.e., top, bottom, right and left.

At least two axial measurements at each position are necessary for checking alignment, if the shafts float axially while being rotated. However, this doesn't provide sufficient data to check the trueness of the coupling and should be used only with flexible couplings.

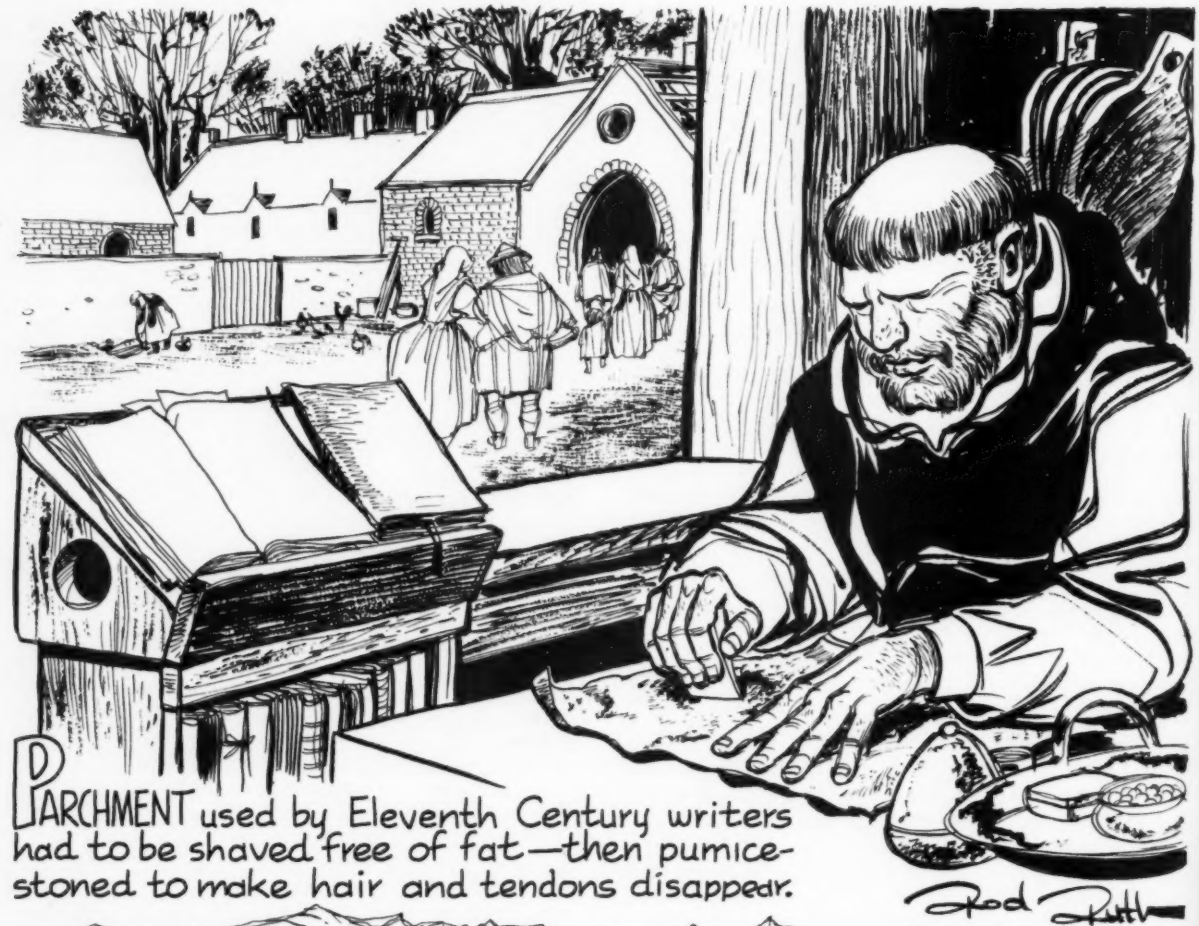
If only one axial measurement is taken at each position, the shafts must be held definitely against the bearing shoulders in one direction.

Only axial measurements are needed for rigid couplings with a pilot or spigot fit between coupling halves, which presumably precludes parallel misalignment. However, it is advisable to take radial measurements to check the accuracy of the pilot fit. Fig. 4 shows how a radial runout is obtained because of angular misalignment.

Effects of misalignment should never be underestimated. Flexible couplings are not completely free of restraint since the flexibility is accomplished either with sliding or flexural members. These members transmit frictional or flexural forces to the shafts, in proportion to the degree of misalignment, which can cause vibration at the bearings and elsewhere.

Misalignment of rigid couplings will cause abnormal bearing loading with reduction in life of the bearings, and bending stresses in the shafts which at times lead to a shaft fatigue failure. In a severe case of misalignment it is impossible to obtain a running balance.

PAPER SKETCHES



PARCHMENT used by Eleventh Century writers had to be shaved free of fat—then pumice-stoned to make hair and tendons disappear.

Rod Ruth

The great Saracenic papermaking city of early middle ages was Samarkand where large flax and hemp crops——and a system of irrigation ——assured abundant papermaking materials..

TO SUPPLEMENT their income, farm families of Formosa weave hats from paper yarn which they get from Japan.

ODD BITS

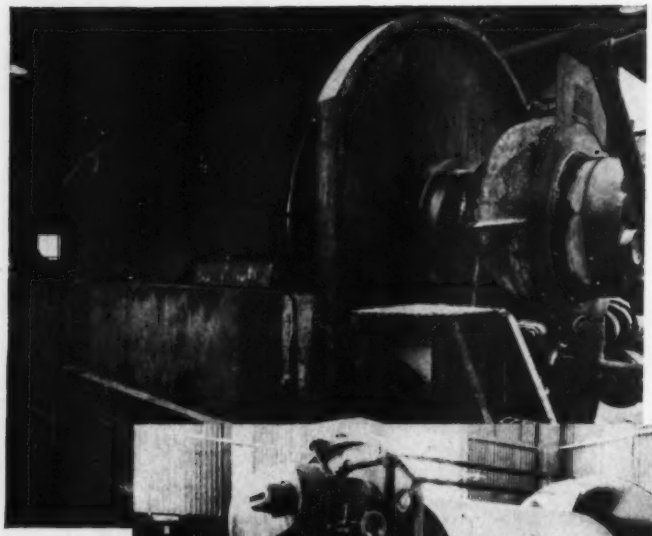
Paper made to envelop cigar tobacco, it is said, was used in printing California's first newspaper, issued August 15, 1846, at Monterey.

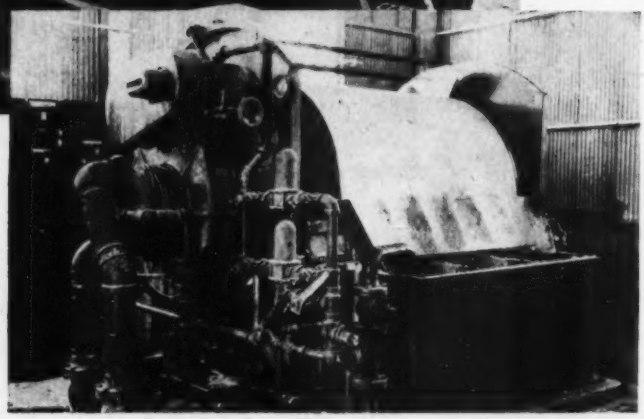
PERKINS
HOLYOKE
®
Perkins Calender Rolls—the natural result of the longest and broadest experience in the industry—give quality that is definitely reflected in your product. Perkins service includes refills of any make of calender rolls.
B. F. PERKINS & SON, Inc.
HOLYOKE, MASS., U.S.A.
LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

OLIVER LIME MUD FILTER

The chemical filter designed to do a **chemical** filtering job

Study these two installation pictures of Oliver Filters. One is handling lime mud in a southeastern kraft mill; the other is handling potash in a west coast chemical plant. Note the similarity of design. Materials of construction will vary, of course, to meet specific conditions. But both are distinctly Oliver "Chemical" Filters.





As for "experience", we can point to nearly a hundred Oliver Lime Mud Filter installations in pulp and paper mills as well as to several thousand Oliver "Chemical" Filters in industry generally. Yes, there's plenty of "chemical" filtering experience back of the Oliver Lime Mud Filter you are planning to buy. Plenty of that necessary chemical filtering "know-how."

OLIVER UNITED FILTERS INC.

New York 18, N. Y.
33 West 42nd Street

Chicago 1, Ill.
221 N. LaSalle Street

Western Sales Div:
Oakland 1, Calif.
2900 Glascock Street
San Francisco 11, California

Sales & Manufacturing Representative:
E. Long Limited, Orillia, Ont., Canada

Factories: **Oakland, Calif. • Hazleton, Pa. • Orillia, Ont., Canada • Melbourne, Australia**

The Paper Industry Association News

More than 700 Attend 6th TAPPI Engineering Conference

Engineering and power problems were featured during sessions of the Sixth TAPPI Engineering Conference held October 15-18 at the General Oglethorpe Hotel, Savannah, Ga. Some 700 delegates from throughout the country attended the meeting.

During the various technical discussions speakers covered subjects ranging from power generation problems to engineering research.

In an address of welcome, G. W. E. Nicholson of Union Bag & Paper Corp., one of the conference hosts, described the tremendous growth of the pulp and paper industry in the South during the last quarter century. At the present time more than half of the 12,000,000 tons of chemical pulp manufactured annually in the United States is made below the Mason-Dixon Line. When expansion projects now planned by southern mills are completed, the region will be able to boast 2/3 of all domestic production.

Other speakers during the general sessions included Julian E. Tobey, president of Appalachian Coals, Inc., whose topic was, "Design Trends in Boiler Installations in the Pulp and Paper Industry in the South." Charles S. Heustis of Southern Paperboard Corp. and Reavis C. Sproull of the Herty Foundation Laboratory were also on the program. Serving as toastmaster and officially opening the conference was George H. Pringle of Mead Corp., retiring chairman of the conference. Special guests included C. J. J. Ninck Blok of Van Gelder Zonen Royal Paper Mills of Amsterdam, Holland, and Ken P. Geohegan, national president of TAPPI.

Technical Sessions Open

Technical sessions at the four-day meeting opened with a discussion of engineering research and machine design. In the absence of Robert A. Nivison, J. K. Perkins of Improved Paper Machinery Co., Nashua, N.H., spoke on "Capacity of Thickeners." After describing the four principal classes of pulp thickeners, Mr. Perkins noted that pulp filters are "sized" by various tests, with capacity varying in relationship to consistency, cylinder speed and submergence. However, capacity does not necessarily vary in direct proportion to any of these factors, but in direct proportion to the filter area.

"Pump Difficulties in Pulp and Paper Mills" was the subject of a paper by Parkman A. Collins and J. G. Rearick of Warren Steam Pump Co., Warren, Mass. It was suggested that further work be done to study gaseous conditions related to vapor pressure and surface tensions in order that more exact recommendations could be made regarding suction head and recirculation to keep the pump suction chamber free of gas and to prevent blocking the passage of stock to impeller unit.

Alfred N. Ball of E. B. Eddy Co. Ltd. discussed selection of paper machine drives. After outlining drive functions, the speaker declared that (1) for speeds of over 1,000 fpm the rapidity of adjustment and accuracy of speed regulation indicate a definite advantage in favor of the sectional electrical drive; (2) that a well-maintained single motor electric drive is extremely satisfactory, with but few exceptions, and (3) that crawling can be accomplished with both systems with helper motors.

"Measuring the Density of Rubber Covered Paper Mill Rolls" was discussed by Ralph M. Leighton of Stowe-Woodward Inc. The three instruments made for testing rubber covered rolls can be compared only within the same stock. This can be done by plotting curves for each individual stock. However, variation can be expected between the Durometer and Plastometer readings, since both the former and the Densimeter are spring instruments and by their nature cannot be as accurate as the Plastometer.

Second Day Features Power

In the hydraulics session which opened the second day of meetings, Victor P. Head of Fischer & Porter Co. discussed hydraulic behavior of paper stock in pumps, pipes, valves, and flow meters. His talk was followed by one on "An Analysis of Data on Stock Flow in Pipes" by Richard E. Durst, Andrew J. Chase and Lyle C. Jenness, all of the University of Maine.

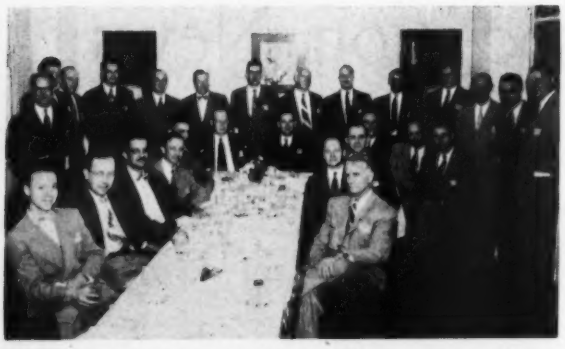
"Materials and Design of Piping Systems for High-Pressure and High-Temperature Service" was the subject of E. A. Kerbey, Midwest Piping & Supply Co. With plans for operating at 900F with 1200 psi, high pressure and temperature service needs to be reconsidered. One of the first considerations in the design of piping is the selection of the proper grade of steel. Three factors must be held in mind: performance under expected operating conditions; its workability in bending, lapping, forming, and welding, and its availability. Increased temperatures operate to present the piping designer with more difficult problems of expansion and flexibility. The same degree of engineering judgment is required in the design of hanger, anchor, and supports.

W. B. Wilson and W. C. Bloomquist of General Electric Co. spoke on combustion gas turbine applications in the paper mill. The gas turbine is well suited where both electric power and process steam is required. Various types of turbines were described, as were various cycle arrangements. Power requirements of Fourdrinier sections was the topic of W. Mikelson of General Electric.

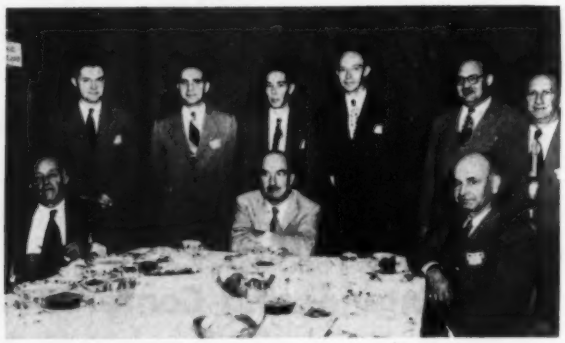
"Properties of Synthetic Rubber and Thermoplastics as Insulation and Sheaths on Electric Cables" was discussed by E. W. Davis of Simplex Wire & Cable Co. Essential properties of an insulating and sheath compound for an electric cable depend primarily on the service conditions, including operating voltage, current load, system characteristics, temperature of surroundings, exposure to heat, light and moisture, and exposure to chemical solutions. Predominant causes of cable failures are as follows: deterioration due to age and oxidation; deterioration due to exposure to oil, water, sunlight, and chemicals; improper termination and splicing, and damage during installation.

In the steam and power discussion, G.

Engineering Committees Meet at Savannah Conference



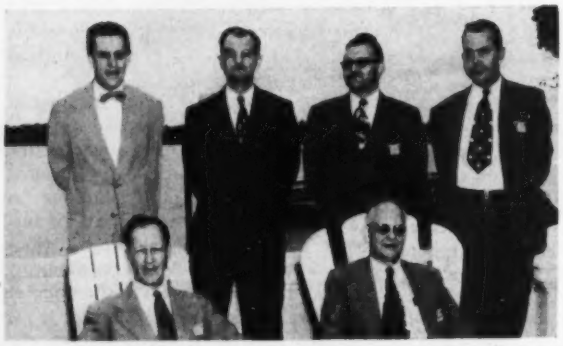
Engineering Division and Machine Design Committee



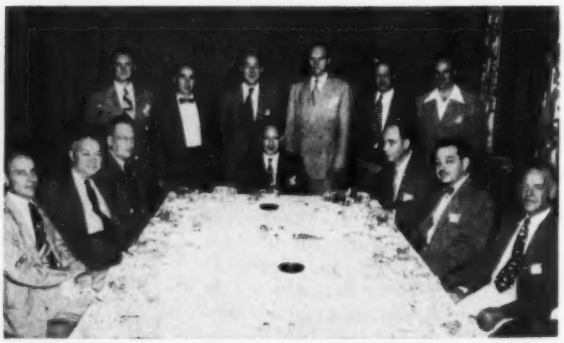
Hydraulics Committee

Chemical Engineering Committee

Mill Maintenance and Materials Committee

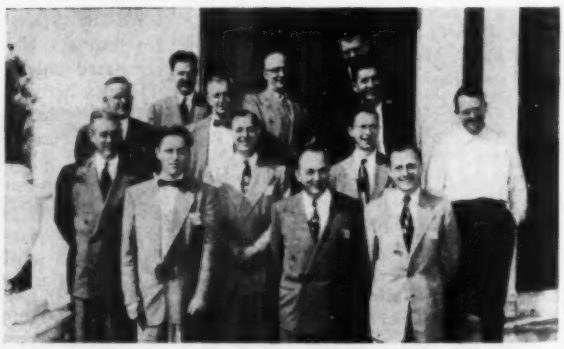


Drying and Ventilating Committee



Steam and Power Committee

Materials Handling Committee



Electrical and Engineering Committee

W. Bollinger of West Virginia Pulp & Paper Co. spoke on cinder collection. "Education of Power Plant Engineers" was discussed by M. F. Schnaufer of Detroit Sulphite Pulp & Paper Co.

Maintenance and Materials

Opening the third day was a talk on high-pressure driers by Charles P. Spalding, Beloit Iron Works, and a discussion on ventilation for the comfort of personnel by L. G. Janett of J. O. Ross Engineering Co.

In the materials handling session, W. H. Rambo and H. A. DeRice, industrial plant engineers of Portland, Ore., discussed woodmill log handling in the pulp and paper industry on the West Coast. "Wood Handling Methods in Pulp Mills of Eastern North Carolina and Virginia" was the topic of C. L. Wills and C. L. Hildebrand of Halifax Paper Co. Pulpwood is stored in five-foot lengths jackstraw style in long piles parallel to a conveyor and handling crane. Storage piles are filled and emptied in rotation. Generally, wood received by rail goes directly to the mill, while truck receipts go into storage. The installation requires 0.48 man-hours per cord of consumption, handling 450 cords per day.

H. Stoess Jr. of Fuller Co. listed the advantages of pneumatic conveyors as freedom from dust, low handling loss or shrinkage, and good labor relations. Disadvantages, although compensative, are said to include higher power cost, higher capital investment, and unidirectional construction. The use and maintenance of steel windows was discussed by K. S. Frazier, Detroit Steel Products Co.

H. R. Meyer of Westinghouse Electric Corp. spoke on electrical maintenance, including electronic equipment. The three enemies of continuous operation are dirt, grease, and moisture. Because of the necessity of water in pulp and paper manufacture, moisture can be a problem, but if it is impossible to keep equipment dry, at least keep it clean. Paul Corning of Rayonier, Inc., spoke on "Maintenance of Insulation in Pulp and Paper Mills." There are three phases of well engineered insulation installation: selection of the most suitable type of insulation, arrangements for a well designed installation, and adoption of a regular inspection and maintenance plan.

All the various technical sessions were followed by discussions consisting of panel groups and prepared addresses. Committee and subcommittee reports on many phases of pulp and paper mill engineering were also presented during the technical programs.

Mill Visits and Barbecue

The final day was devoted to two mill visits and a barbeque at the Mary Calder Golf Course, with Union Bag & Paper

Corp. serving as host. Visits were to the Union Bag mill in Savannah and to the Southern Paperboard Corp. mill at Port Wentworth.

New Officers Elected

Charles J. Sibler, chief engineer, West Virginia Pulp & Paper Co., was elected chairman of the Engineering Division to succeed George H. Pringle, Mead Corp.; W. C. Bloomquist of General Electric Co. was elected secretary to succeed J. W. Hemphill, Johns-Manville Sales Corp. H. R. Arnold, Riegel Paper Corp., Acme, N.C., was elected chairman of the steam and power committee to succeed Mr. Sibler.

It was announced that the 1952 Engineering Conference will be held October 12-16 at the Morrison Hotel, Chicago.

Maine-New Hampshire TAPPI Hears Talks on Statistics

The Maine-New Hampshire Section of TAPPI met at the University of Maine October 5-6 to hear a series of talks on methods of statistical quality control.

In discussing "Facts vs. Opinions," Warren R. Purcell of Brown Co., declared that when a process is in need of adjustment, as indicated by an unsatisfactory product quality, statistics can be used to tell the amount, direction, and time that the adjustment should be made. Arthur Bender Jr. of the Delco-Remy Div., General Motors Corp., spoke on "Probability." He cautioned that a casual examination of a statistical analysis may seem directly opposed to personal experience, but that on closer examination of the problem the reason can usually be determined.

In "Applications of Statistical Methods in the Pulp Mill," F. L. Riley of Brown Co. illustrated the independent relationships of three sets of statistical data (independent variables) when plotted against a fourth set (dependent variables), all data collected from the same process. H. W. Cobb of S. D. Warren Co., in explaining the application of statistical methods on the paper machines, told how tests can be applied to statistical data to properly evaluate such data.

R. T. Trefla of Hercules Powder Co. discussed applications of statistical methods in the coating plant. He listed the following classification of statistical techniques: (1) presentation of data; (2) control charts; (3) correlation; (4) tests for significance; (5) experimental design; (6) sampling, and (7) analysis of variance. In "Applications of Statistical Methods of Research," P. M. Schaffrath of Oxford Paper Co. declared that by means of statistics and the various tests that can be applied to statistical data, such as variance and significance, uncontrolled variables can be detected.

Empire State Division

National Paper Box Manufacturers Association, has elected Arthur C. Friedel chairman. Mr. Friedel is president and general manager of J. F. Friedel Paper Box Co., Syracuse. Other officers elected include A. E. Grate, Rochester, vice president; William C. Milsom, Buffalo, director; Robert W. Sisson, Gloversville, Henry L. Burns, Tonawanda, Charles DeFreest, Albany, Robert E. Stanton, Oneida, and C. E. Howell Jr., Elmira, members of the advisory board.

CHICAGO TAPPI SPEAKERS during the November dinner meeting. They are (l to r) F. D. Long, H. T. Spannuth, A. T. Luey, D. R. Erickson, L. E. Whitmore, M. L. Downs, and A. I. Totten Jr.

Chicago TAPPI Holds Symposium on Greaseproof Boards and Papers

More than 200 members and guests attended a joint session of Chicago TAPPI and the Folding Paper Box Association of America, held in Chicago November 19. The afternoon-evening meeting featured a symposium on folding cartons, with special emphasis on greaseproof boards, papers, coating, films, and foils. Seven speakers discussed various technical aspects.

Presiding during the session was Vance V. Vallandigham of Kelco Co., Chicago TAPPI chairman; while F. D. Long, technical director of Container Corp. of America and chairman of the research and technical committee of the Folding Paper Box Association, served as moderator.

In opening the symposium, Mr. Long noted that perhaps the approach of seeking a perfect material from the greaseproof standpoint is a mistake. Instead, it might be best to view the problem from the standpoint of actual use, where protection is sometimes required for only a few days, as contrasted with other instances where longer protection is required. This opens the way for many papers, coatings, films, and other materials and processes. The all-purpose, grease-resistant material might well be too expensive for consumer packaging.

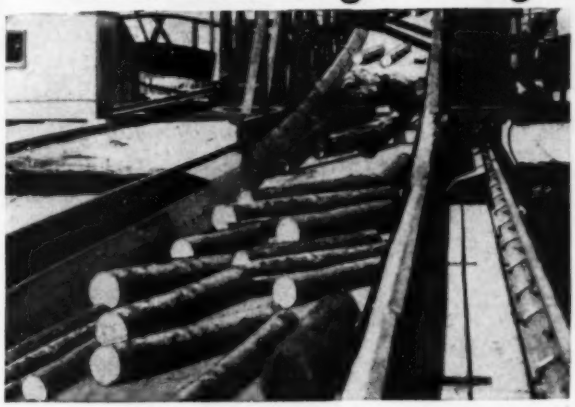
Polyethylene Coatings

L. E. Whitmore of the Bakelite Co., Chicago, opened the session with a paper entitled "Polyethylene Coatings." Polyethylene coatings on board or paper are applied either by a hot melt method or an extrusion lamination method. The latter involves, first, the extrusion of a film and, second, the immediate lamination to a web or board of paper. In certain cases, a third method involving application from hot solution is being used. For this purpose, polyethylene is soluble in commercial solvents, including Toluene, at a temperature of about 90C. With either method, it was found that higher molecular weights of polymers slowed operations so that lower molecular weights have been used with best results.

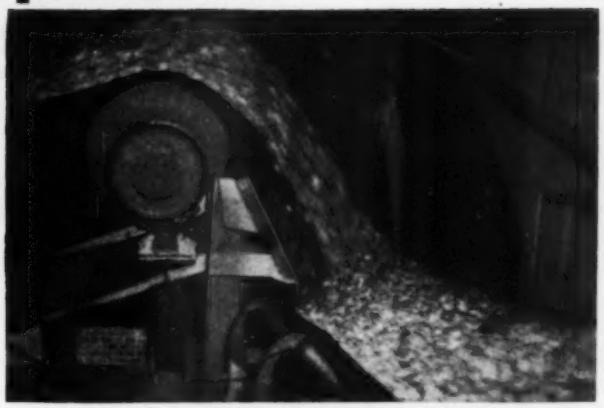
The speaker declared that polyethylene is not the answer to all problems of producing greaseproofness; that its greaseproofness is relative, but that it takes a long step toward a completely satisfactory material. Vinyls have a very definite place in the greaseproof picture. However, polyethylene opens an entirely new field of applications.

Polyethylene as a paper or board coating makes possible the production of packages with physical characteristics not heretofore possible with any previously known coating material. When used in conjunction with wax, polyethylene shows the following advantages: (1) resistance to grease transfer before and after conversion; (2) good moisture-vapor-transfer resistance; (3)

LINK-BELT engineering experience...

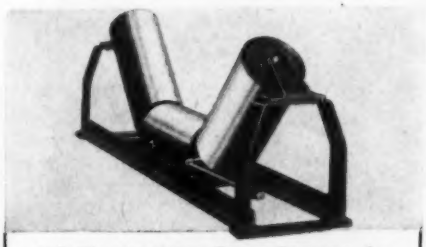


PULPWOOD LOGS are carried on log handling belt conveyor to stacker which discharges pulpwood to stockpiles.

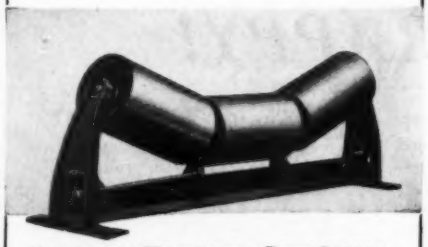


TRANSFER of wood chips from one Link-Belt belt conveyor to another, both using 45° troughed belt idlers.

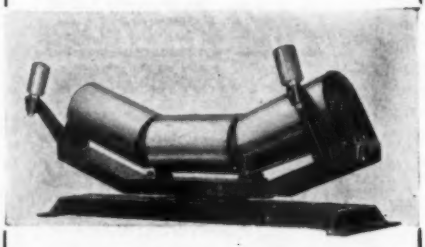
Plus LINK-BELT quality components...



45° TROUGHED BELT IDLERS for wood chips carry larger volume per lineal foot, resulting in lower cost per ton handled.



SERIES 100 TROUGHED BELT IDLERS. Strong, balanced integral rolls revolve on high-grade roller bearings, Grease-in, dirt-out seal, large reservoir preserve lubricant.



BELT-TRAINING IDLER for automatic belt positioning. The actuating rolls respond to slightest contact — quickly recede and center the belt to minimize wear.

...add up to your best bet in

BELT CONVEYORS

FOR logs, chips, chemicals and other bulk materials, Link-Belt Belt Conveyors pay off in high capacity and low-cost handling.

Whatever the conditions, you'll find the right answers at Link-Belt. For Link-Belt designs conveyor systems to meet your requirements. Backed by unmatched materials handling and power transmission experience, our conveyor specialists help you and your consultants get the right equipment in the right place.

One Source—One Responsibility

Link-Belt makes all the various elements—all types and sizes of idlers, takeups, pulleys, trippers, bearings and power transmission drives. Plus all related equipment—other types of conveyors, feeders, elevators, car dumpers and shakers.

And Link-Belt will build your supporting structures and enclosures . . . install the job completely. One source — one responsibility. Every detail receives the proper attention to assure you an efficient, trouble-free, long-life conveying system.

The next time you need belt conveyor engineering assistance, call the Link-Belt specialist in our office near you.

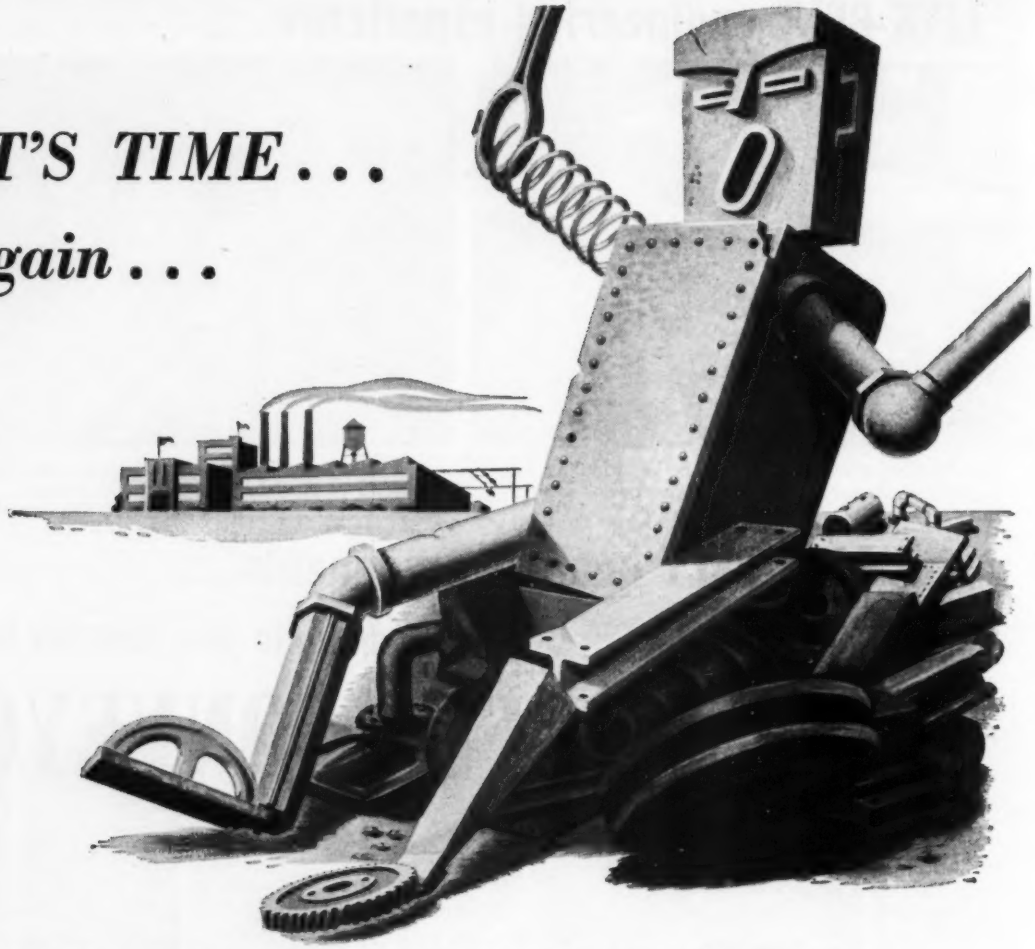
LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities. 12.512

IT'S TIME . . .

again . . .



TO WAKE UP SCRAPPY!

Scrap's getting scarce again . . . compared to the amounts we need . . . and it's up to *all* of us to *help* produce enough steel.

107,000,000 tons of steel is the present rate of production in 1951 . . . 119,500,000 tons is expected in 1952.

Last year, 1950, we produced 97,800,000 tons.

All that extra steel—enough to take care of *both* military and civilian needs—calls for *more scrap iron and steel.*

Scrap Inventories Are Alarmingly Low

While steel mills are producing at a greater rate than ever, scrap inventories have dwindled. Many mills are operating on a hand-to-mouth basis with shut-downs threatened unless we furnish more scrap.

We *do* have the scrap. It's everywhere, not just in the form of *production* scrap—the "leavings" of machining, normally turned over to scrap dealers . . . but also in the form of *idle* metal: obsolete machines and tools, no-longer-usable jigs and fixtures, gears, chains, pulleys, valves, pipe, abandoned steel structures, etc.

We must have this *idle* metal to keep the furnaces running.

Please cooperate. Set up a Scrap Salvage Program in your plant—*now.* For a complete plan on "how to do it", write for booklet "Top Management: Your Program for Emergency Scrap Recovery". Address Advertising Council, 25 W. 45 Street, New York 19, N. Y.

Why Do We Need *Scrap?*

Steel is made half from pig iron, half from scrap. With production on the increase, more scrap must be purchased. And it's up to you to "dig it out" and sell it.

NON-FERROUS SCRAP IS NEEDED, TOO!

This advertisement is a contribution, in the national interest, by

The Paper Industry

A PUBLIC SERVICE PROJECT · THE ADVERTISING COUNCIL

good heat sealing properties, and (4) good flexibility.

Greaseproof Papers and Laminations

M. L. Downs, Thilmany Pulp & Paper Co., Kaukauna, Wis., discussing greaseproof papers and laminations, declared that with more than one method of solving the greaseproof problem, glassine and greaseproof papers provide some of the less costly methods of attaining the goal, since these sheets can frequently do the required job for 30 to 50 per cent of the cost of competitive materials. The results are not as absolute as might be obtained with some other materials, but the cost of materials that would give absolute protection is frequently too high for the product in question.

Both glassine and greaseproof papers are made from pulp (sulphite or kraft) that is treated to result in high pentosan and low alkali-cellulose content. Both are given long beating time, particularly glassine, so that freeness is very low and the result is more or less a cellulose jell. The result is a slow-running sheet with very close formation, and, although a standard Fourdrinier is used, the wet end is modified to get faster drainage. This would result in a greaseproof sheet. If glassine were desired, the sheet would be remoistened and then super-calendered with pressures of 1,500 lb. and using a stack of steel and cotton rolls. Thus, glassine is merely a transparent form of greaseproof paper, although it is more greaseproof because it is more compact. With glassine, grease transfer is mainly through pin holes or through capillarity at points of raised fibres.

Commonly used glassine and greaseproof sheets in the board industry are 25-30 lb. basis (24-36-500), which are readily available, with other weights also available. Many of the sheets are opaqued with titanium dioxide to cover up the chipboard to which the greaseproof sheet may be laminated. These papers are also frequently used in colored form on folding cartons or in corrugated forms for bakery goods. In laminating to board, aqueous adhesives are not ordinarily used because they cause glassine and greaseproof to swell and to reverse the properties; but aqueous adhesives in modified form (possibly of higher viscosity) can be used. In addition, micro waxes are frequently applied to the films to lend moisture-vapor resistance or other properties.

Aluminum Foil and Paper Laminations in Packaging

A. I. Totten Jr., director of research for Reynolds Metal Co., Richmond, Va., spoke on the place of aluminum foil and paper laminations in packaging. In connection with paperboard containers, there are many applications possible in

These new bulletins make it easier for you to select the right pump

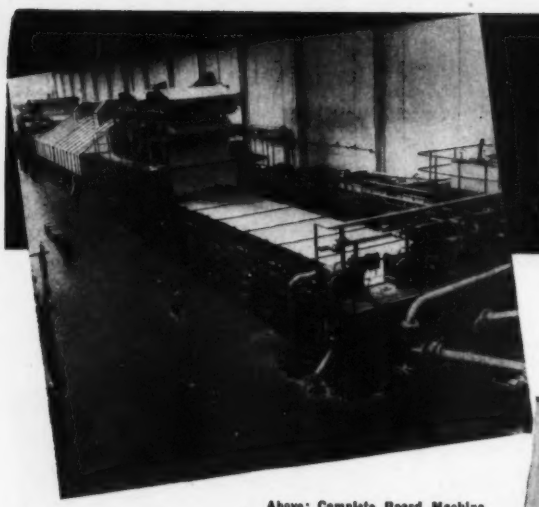
These new bulletins have been designed to help you. New sizes are listed, and, in each bulletin we have put a composite rating chart which includes both "Close-Cupld" and the supporthead. This makes it dead simple to put your finger on the right pump for your requirements.

Another valuable feature of these bulletins is the parts chart. Using this you see exactly what parts are interchangeable for all size pumps and so can keep your spare parts investment to a minimum.

Use the coupon below to send for these useful FREE bulletins *today*. Goulds Pumps, Inc., Seneca Falls, N. Y.

Goulds PUMPS INC. Seneca Falls New York

GOULDS PUMPS, INC.
Dept. PI, Seneca Falls, N. Y.
Send Bulletin 710.1 ☐
Bulletin 715.1 ☐
Name_____
Company_____
Address_____
City_____ Zone___ State____

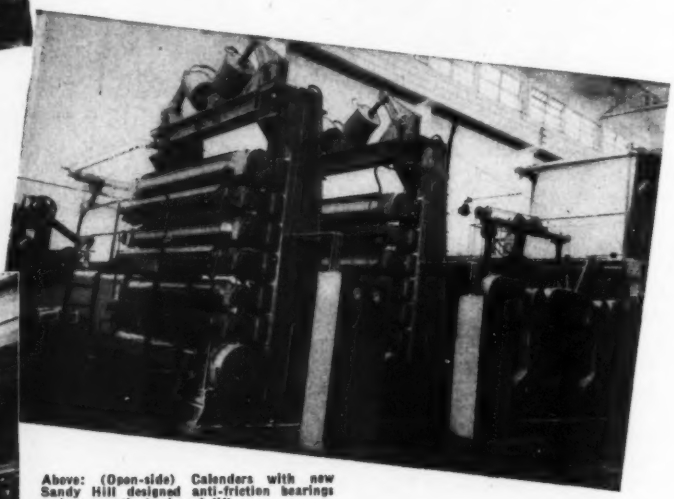


New *Sandy Hill* Multi-Vat Board Machine with many unusual features

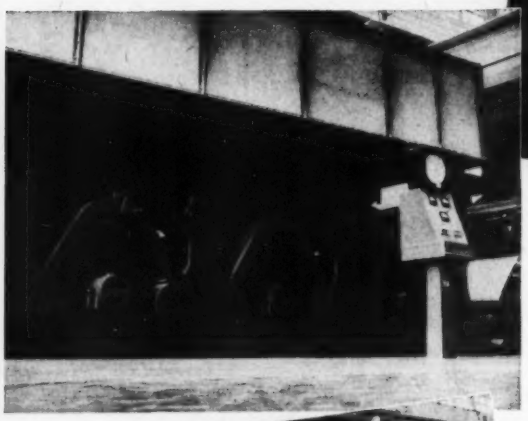
Versatile custom-designed machine makes everything from patent coated to test liner. Produced marketable board immediately on start-up.

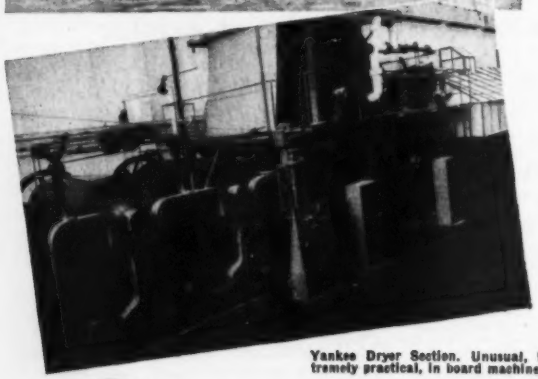
Below: Dryer section showing the sturdy box type framing and ring oiling bearings.

Above: Complete Board Machine. Available overhead room in this plant made possible the special arrangement for cleaning of the top wet felt and the second press felt.



Above: (Open-side) Calenders with new Sandy Hill designed anti-friction bearings and pneumatic load and lift.





Yankee Dryer Section. Unusual, but extremely practical, in board machine design.

In accordance with Sandy Hill's policy of working closely with its customers, this complete board machine was built with individual mill problems and marketing goals in mind. To achieve a high finish on one side of the board without reduction in bulk, a Yankee Dryer Section was incorporated . . . an unusual step on a board machine. Another revolutionary feature is the open side calenders using anti-friction bearings and pneumatic load and lift.

The Sandy Hill sales-engineering group welcomes an opportunity to consult with you, whether your needs are for a standard item of equipment or a completely custom-designed pulp and paper plant.

Write for our Brochure of Pulp and Paper Making Machinery.

The Sandy Hill Iron & Brass Works

Hudson Falls, N.Y.

Machinists and Founders Specializing in Paper and Pulp Mill Machinery

Manufacturers of
Adjustable Cylinder Vats
Cylinder Paper Machines
Kamyr Pulp Grinders
Dandy Roll Drives

Pulpers or Kneaders, Voith Thickeners
Quick Opening Gate Valves
Bertrams Flow Distributors
Bertrams Shakes

Neilson Slice
Kamyr Feltless Wet Machines
"Selective" and Corner Drives
Fourdrinier Paper Machines
"Packer" Screens

Castings
Kamyr Bleaching Equipment
Scofield Felt Conditioners
Cleveland Type Bearings
Shaker Screens

AT THE HEAD TABLE V. V. Vallandigham (l) opens the November meeting. After the dinner, members and guests give full attention to the speakers.

combination with aluminum foil. One is a bag or liner of two sheets of foil laminated to a thin sheet of paper, resulting in high resistance to moisture-vapor transfer. Another is the use of foil or a lamination as the outer wrap of a fibre can, which not oly results in high MVT resistance, but greatly improves the appearance from a marketing standpoint. Foil or its laminants can also be used as carton inner or over wraps, and common examples are in the shipment of dried fruits and the overseas shipments of cigarettes. Foil-wrapped cartons for photographic film shipped overseas have so added to protection that they have eliminated the need for film expiration dates. Vinyl and foil laminations also have possibilities in the field of grease resistance.

Aluminum fits in well with folding cartons because it is relatively free of pin holes; can be bent sharply, when annealed, without fracturing; is nontoxic, and has high resistance to grease and moisture-vapor transfer.

Greaseproof Method and Formulation

Most of Dr. D. R. Erickson's paper was devoted to a new method of greaseprofing by precipitating a polymer that is insoluble in water and preferably in other solvents, in such a manner so that the polymer remains on top of the sheet in a continuous film. Dr. Erickson, a consultant at Kalamazoo, Mich., declared that alkali soluble hydroxyethyl cellulose seems to be such a material; it is soluble only in dilute aqueous sodium hydroxide and can be precipitated from its solution and neutralized by contacting with any aqueous acid salt or ammonium salt solution. By this means, the solution is transformed into a continuous solid film, and the contained water is simultaneously released as free water. The water can then be squeezed and dried out in the normal manner.

This is referred to as the precipitation method of coating, resulting in films of about 0.001. The board or paper stock produced is similar to one laminated with a thin sheet of P.T. Cellophane, having resistance to grease, oil, and solvents, and presenting an excellent barrier to oxygen and CO_2 transmission. Low temperature flexibility and MVT resistance is no better than for Cellophane, so that thin films of lacquer or resin should be applied for high MVT resistance. These films may be as low as ½ lb. per M sq. ft. because the solvents cannot penetrate the hydroxyethyl cellulose surface.

Greaseproof Paper Survey

A. T. Luey of Sutherland Paper Co., Kalamazoo, Mich., presented a classification of grease resistance by end uses. Included were methods of testing or evaluating grease resistance, materials available or in use at present, and a general cost picture.

Greaseproof Requirements

H. T. Spannuth of Wilson & Co., Inc., Chicago, declared that greaseproofness in packaging should signify more than protection of appearance from migration of the fatty substance. In a paper entitled "Greaseproof Requirements," Mr. Spannuth said that greaseproofness should mean economical, convenient and attractive packaging so that the qualities of the product are adequately protected, as related particularly to the fatty ingredient. This should also be achieved with proper perspective to other requirements for good packaging.

This may call for material free of pro-oxidant effects or even give antioxidant effect. Other requirements might be (1) barrier to oxygen or odors; (2) passage of odor; (3) opacity to light or passage of certain wave lengths, and (4) support, insulation or concealment of limited soakage.

January Program on Corrugating

It was announced that the January 21 program will feature a panel of experts discussing the field of corrugating. The meeting will have morning and afternoon sessions, with a cocktail hour and dinner preceding the evening program. Participants will include George A. Zinkil, Central Fiber Co., moderator; Harry J. Bettendorf, Board Products Publishing Co.; George A. Farrah, National Container Corp.; M. Leon Hamilton, Container Corp. of America; Paul Harrison, Velocity Steam Co.; Charles Neeley, Eddy Paper Co., and other speakers yet to be selected. Meetings are held at 29 S. LaSalle St.

Sulphur Discussed at Pacific TAPPI

Three papers dealing with various aspects of the sulphur problem were presented at the October 26 meeting of the Pacific Section of TAPPI, held at Bellingham, Wash.

Addressing the group on "Sulphur Savings at Camas," J. V. Savage of Crown Zellerbach Corp., Camas, Wash., explained the method by which the CZ mill has reduced it sulphur consumption. The plan of operation by which 40 pounds of sulphur has been saved per ton of pulp is as follows: (1) chip packing; (2) a long pressure reduction period at the end of the cook, and (3) forced circulation from the bottom area of the digester to the top.

A. Halvar Lundberg, chemical pulp mill engineer, spoke on "Pyrite Plants for Sulphite Acid." The roasting of pyrites in the pulp industry is not new. It has been practiced in Europe for many years, and one Canadian pulp mill has operated a pyrites burning unit since 1932. There is no reason why the sulphite industry should not give pyrite roasting serious consideration. New furnace designs eliminate many of the earlier objectionable features. The Nichols Freeman Flash Roaster and the Door Co. FluoSolids System can deliver burner gases of 12 to 14 per cent SO_2, are relatively simple to operate, and the maintenance is not high.

Al Graef and J. T. Firestone of the pulp division, Weyerhaeuser Timber Co., Everett, Wash., spoke on "Sulphur Consumption at a Bleached Sulphite Mill." As a preliminary effort prior to the installation of equipment designed to effect a sulphur savings, changes were made in the operation of the acid system. The liquid flows were regulated to obtain the most efficient operation possible, while still not losing SO_2 to the atmosphere. The introduction of caustic soda aided these changes by increasing the absorbing capacity of the system. Several schemes were tried in the digester house and blow pits to enable more

YES... wherever I've got a Graton & Knight Engineered Leather Belt!

Machine and motor manufacturers often depend upon the belt to provide a factor of safety for their equipment. Motors that accelerate quickly to full power, and machines that must handle peak loads, might stall were it not that the belt acts as a "fluid drive," absorbing starting torque and load shock.

To do this successfully the belting must possess *"Live Traction."* This includes an amazing combination of qualities: strength, resiliency, flexibility, wear-resistance, long life, and a high coefficient of friction. Unless a belt has all of these qualities it will cause wear on motors and bearings, injury to machines with reduced output, and will eventually destroy itself.

Live traction is developed to the highest degree in Graton & Knight *Engineered* Leather Belting. The best leather in the best hides are tanned and processed to develop belting that performs like a fluid drive: pulling your peak loads without slipping — absorbing the shocks of starting and stopping without damage to itself or to your equipment. And these results can be obtained under all sorts of adverse conditions.

Yes—you can drive it better with leather when the belt is engineered for you by Graton & Knight. For this company has specialized in leather belting for 100 years, and has all the answers to your belting problems. May we prove it to you?

GRATON & KNIGHT COMPANY
WORCESTER, MASSACHUSETTS

HEART OAK · PREMIUM RESEARCH QUALITY · SPARTAN

100 YEARS OF SERVICE TO INDUSTRY

YOU CAN DRIVE IT BETTER WITH LEATHER*

GRATON AND KNIGHT

*Engineered LEATHER BELTING

SO_2 to be returned to the acid-making system, rather than to be lost in the sewers.

"Semichemical Pulping Characteristics of Pacific Coast Red Alder, Douglas Fir, Western Red Cedar, and Western Hemlock" was the title of a paper presented by four chemists associated with the Forest Products Laboratory at Madison, Wis. The authors were J. N. McGovern, E. L. Keller, J. S. Martin, and R. M. Kingsbury. The red alder gave neutral sulphite pulps having excellent promise for use in container boards and bleached paper products. The softwoods required typically high chemical and fiberizing energies in semichemical pulping by the neutral sulphite process. Beginning with the highest, the order of over all strength properties of the pulps was: hemlock, red cedar, second growth Douglas fir, and old growth Douglas fir. The sulphate semichemical pulps made from red alder and old growth Douglas fir had lower chemical requirements and were generally lower in bursting strength and higher in folding endurance than their neutral sulphite counterparts. Strong, bleached, neutral sulphite pulps can be produced in yields of 55 per cent from red alder and 50 per cent from second growth Douglas fir.

Remaining meetings for the Pacific Section will be: January 15, 1952, at Seattle, subject to be announced, and March 21 at Camas, annual Shibley Award Contest.

Coming Events

Feb. 17-21, 1952—American Pulp & Paper Assn., annual meeting, Waldorf-Astoria Hotel, New York, N.Y.

TAPPI meetings

Dec. 11—Ohio Section, Columbus.

Dec. 21—Lake Erie Section, Christmas party, Cleveland.

Jan. 15, 1952—Pacific Section, Seattle.

Feb. 18-21—Annual meeting, Commodore Hotel, New York, N.Y.

May 5-8—Third Coating Conference, Sherman Hotel, Chicago.

American Pulp and Paper Mill Superintendents Association meetings

Jan. 24, 1952—Miami Valley Division, Manchester Hotel, Middletown, Ohio.

Feb. 1—Connecticut Valley Division, Roger Smith Hotel, Holyoke, Mass.

June 17-19—Annual meeting, Book-Cadillac Hotel, Detroit.

Other meetings

Jan. 14-17, 1952—Plant Maintenance Show and Conference, Convention Hall, Philadelphia.

Jan. 23-25—Canadian Pulp & Paper Assn., technical session, Mount Royal Hotel, Montreal, Que. (annual meeting).

are you opening up sales opportunities?

You are if YOUR paper is made from Curlated pulp and has all of these *plus* properties . . .

1. Maximum Tearing Strength
2. Maximum Stretch
3. Maximum Bulk
4. Maximum Bending Properties
5. Maximum Cleanliness
6. Maximum Cross Directional Strength

Only obtainable by Curlation

Yes, only Curlation can give your paper *all* these properties mechanically because Curlation not only changes the shape and diameter of fibers, but reduces fiber bundles and dirt. Curlator's patented rubbing and rolling process twists and flexes fibers under pressure . . . changes them permanently from straight to "curled." Thus more desirable properties are imparted to the finished paper than would be possible with straight (uncurlated) fibers.

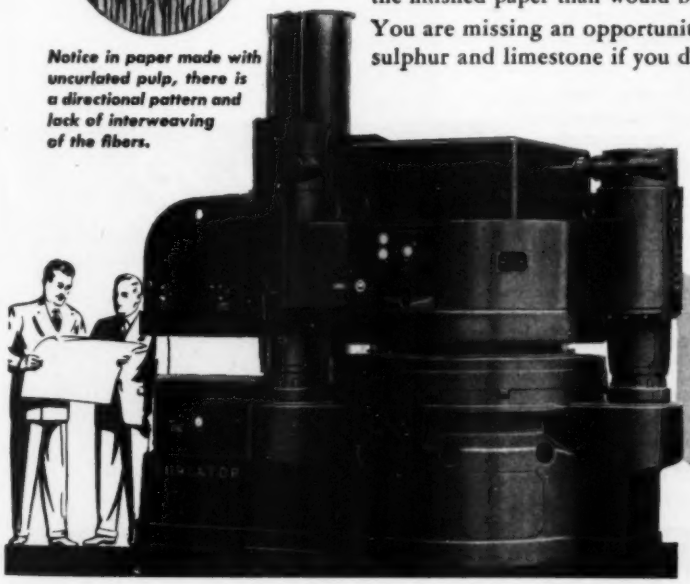
You are missing an opportunity to upgrade pulp, save on wood, coal, sulphur and limestone if you don't investigate Curlators.

Let's look at **CURLATION . . .**

Notice that in paper made with Curlated pulp, the fibers are interlocked and lie in every possible direction.

Notice in paper made with uncurlated pulp, there is a directional pattern and lack of interweaving of the fibers.

WRITE *today for more detailed information.*



CURLATOR† *Corporation*

565 BLOSSOM ROAD · ROCHESTER 10, NEW YORK

†T. M. Reg.—Curlator Corporation, Rochester, N. Y.

Machining a casting of this size requires special equipment—big equipment for handling big jobs.

Actually, this casting is small compared to the complex piping systems that are planned, prefabricated, and tested *under one roof* at Pittsburgh Piping and Equipment Company.

At P.P.&E. all facilities are integrated . . . engineering, metallurgical and mechanical laboratories, bending, Van Stoning, machining, heat-treating, stress-relieving, testing.

Because our manufacturing personnel and equipment are all under the roof of one great plant—our complete know-how, experience, and facilities are constantly available on every job.

This is another reason why you can depend upon Pittsburgh Piping and Equipment Company for service that provides greatest safety, highest efficiency, and longest life from high temperature, high pressure piping.

Pittsburgh Piping
AND EQUIPMENT COMPANY
10 Forty-Third Street — Pittsburgh, Penna.

Woolworth Building, New York
Whitehead Building, Atlanta
Book Tower, Detroit
525 Market Street, San Francisco
Peoples Gas Building, Chicago
Public Square Building, Cleveland
10 High Street, Boston
Heights State Bank Bldg., Houston

The Paper Industry Names in the News

Southern Experiment Station Announces Appointments

Appointment of *LEWIS R. GROSENBAUGH* as chief of the division of forest management research at the Southern Forest Experiment Station, New Orleans, was announced recently. He succeeds *PHILIP R. WHEELER*, who has been named chief of the division of forest economics at the same station.

Other Southern changes include the following. *HERBERT H. MUNTZ*, forester at the Alexandria, La., branch, is to become officer-in-charge at Birmingham, Ala., succeeding *NORMAN B. GRISWOLD*, who has been transferred to the Northeastern Forest Experiment Station at Philadelphia. *DAVID BRUCE*, forester at the branch in Gulfport, Miss., has been named officer-in-charge at that station to succeed *T. E. MAKI*, who recently accepted an appointment as professor of management at North Carolina State College. *EDWARD M. GAINES*, officer-in-charge in southern Alabama and western Florida, is to transfer to the southwestern station at Tucson, Ariz. He has been succeeded by *WALT HOPKINS* of the Alexandria branch.

J. D. ZELLERBACH, president of Crown Zellerbach Co., San Francisco, was elected a member of the National Industrial Conference Board at the board's annual meeting held recently in New York, N. Y.

O. W. Hein Made Black-Clawson Vice President

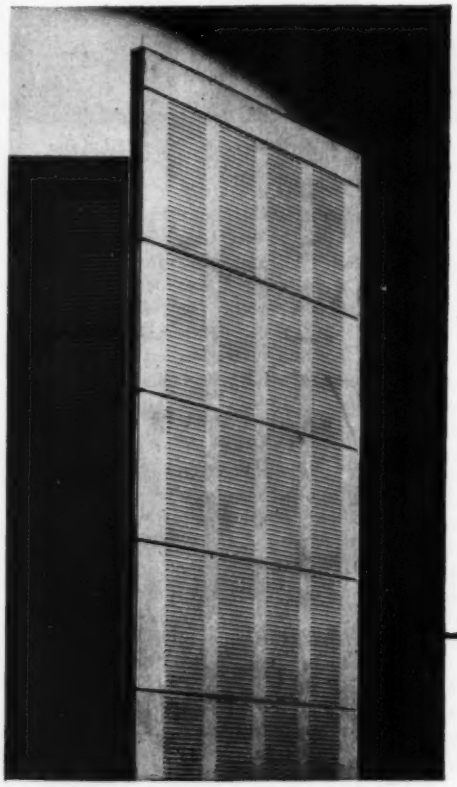
The board of directors of Black-Clawson Co., Hamilton, Ohio, has elected *O. W. HEIN* to the position of vice president. He will serve as a member of the executive committee.

Prior to his appointment, Mr. Hein was assistant plant manager of the Shartle Div. and director of research and development for the Black-Clawson, Shartle, Dilts organization. He joined the Shartle Div. in 1920 as traffic manager. In 1946 he was promoted to the post of production manager.

O. W. Hein

G. A. Farrah

GEORGE A. FARRAH, technical director, has been named assistant to Lionel M. Goldberg, vice president and assistant to the president of National Container Corp. He will handle con-



Here's Why More Than

30,000 FABRICATED SCREEN PLATES

Are Now In Service

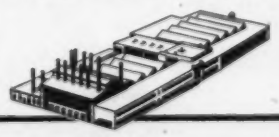
"Hardy" fabricated screen plates, made by Magnus, have a high-strength, thin-sheet design—specially engineered for maximum flow. That's why you're sure of these 3 service-proved advantages:

1. **Increased Plate Capacity**—The thin sheet eliminates relief milling, and with recommended arrangement, substantially increases capacity per plate.

2. **Longer Life**—Slots remain sharp, side walls highly polished for the life of the plate. There's greatly improved corrosion resistance.

3. **High, Sustained Yield**—You get consistent, uniform quantities of cleaner pulp.

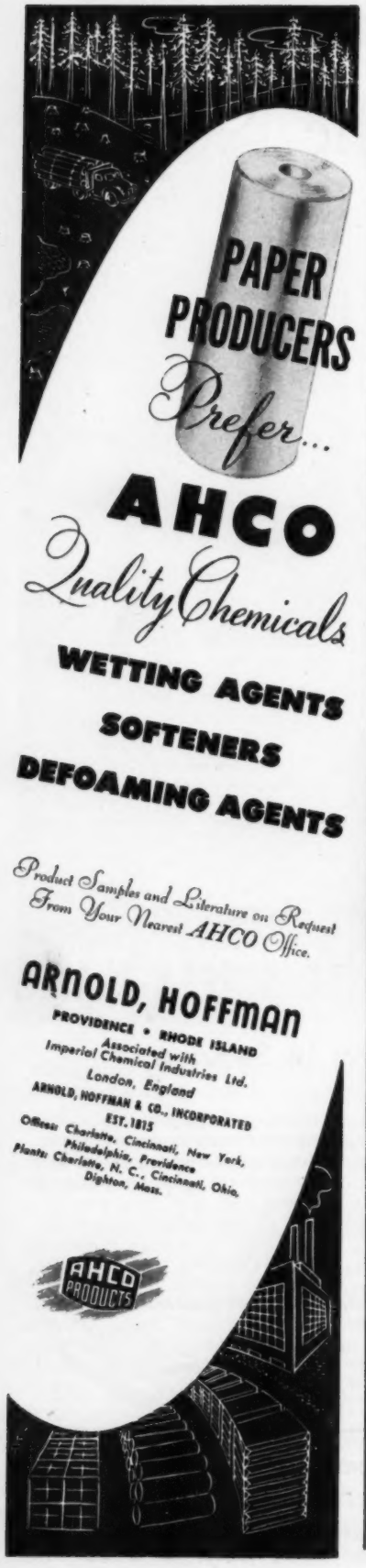
It all adds up to improved performance at reduced operating costs. Complete information is yours on request. Or if you like, we'll gladly have an engineer call.



MAGNUS METAL CORPORATION, *Fitchburg, Massachusetts*

Metalworkers for the Paper Trade

SCREEN PLATES: BRONZE, CHROME-NICKEL-STEEL, AND INCONEL
VALVES: GATE, SWING CHECK, BLOW, GLOBE, ANGLE AND "Y"



verting plants in the Wisconsin and Minnesota area. Mr. Farrah is a member of the TAPPI corrugated containers committee.

Columbia-Southern Makes Sales Appointments

Several further appointments in the sales organization of Columbia-Southern Chemical Corp., Pittsburgh, have been announced recently.

C. F. BINGHAM, formerly manager of pigment sales, has been named assistant director of sales, as has *J. F. DOCKUM*, the former Philadelphia district sales manager. Both are to be located at the firm's Pittsburgh headquarters. *R. M. SIMPSON* is to become acting manager of pigment sales, while *P. A. FODOR*, formerly of the market research and development department, is to succeed Mr. Dockum as Philadelphia manager.

E. M. ROLLINS has been named district sales manager at Dallas, Texas, with supervision of the Houston and New Orleans branch offices. *C. J. STROEMPLE* has joined the market research and development department. He was formerly concerned with technical service at the firm's Barberton, Ohio, plant.

C. F. Bingham

J. F. Dockum

JOHN M. CAMP of Franklin, Va., has been appointed director of the Lumber and Wood Products Division of the National Production Authority, Department of Commerce. Until his retirement in 1950 Mr. Camp had been a vice president and director of Camp Mfg. Co.

Minnesota & Ontario Paper Co., Minneapolis, has announced the election of two men to the firm's board of directors. *THOMAS L. DANIELS*, president of Archer-Daniels Midland Co., Minneapolis, and *C. GORDON COCKSHUTT*, Brantford, Ont., buisnessman, were elected at a board meeting in Chicago November 7. They replace R. H. M. Robinson of Minneapolis and George A. Dobbie of Galt, Ont., both of whom died early this year.

DR. JACK B. CALLAWAY, sales promotion manager for dry colors in the pigments department of E. I. duPont de Nemours & Co., Wilmington, Del., has been made manager of West Coast sales, with headquarters in Los Angeles. He succeeds Robert P. Enslin, who died recently. Dr. Callaway is to be succeeded by *M. J. McLAIN*, a salesman in the Cleveland office. Replacing Mr. McLain in Cleveland will be *LELAND F. ANDREWS*, a research supervisor for technical service at the Newark, N.J. pigments laboratory.

Cornell Paperboard Products Co., Milwaukee, has honored three employees with 40 or more years' service. The men are *GUS PONIK*, 51 years; *EDWARD RASKE*, 44 years, and *EDWARD DALTON*, 40 years.

DuWAYNE R. CARLSON has been appointed foreman of quality control at the Lockland, Ohio, plant of Gardner Board & Carton Co. He will assist *B. E. SOOEY*, chief of quality control.

HARRY J. FARRA, sales engineer with Moore & White Co. since 1947, has been named sales manager of the Philadelphia firm. Mr. Farra was formerly with Lobdell Co., Wilmington, Del., where he was chief engineer and later headed the paper machinery sales division.

P. A. Fodor

H. J. Farra

MALCOM G. CHACE has resigned as a director of International Paper Co. He had been a member of the board since 1922 and for many years served as a member of the executive committee. Mr. Chace has been succeeded by his son, *MALCOM G. CHACE JR.*, a director of Manufacturers Mutual Fire Insurance Company of Rhode Island.

Sales Changes at Jeffrey Mfg. Co.

Major changes in the industrial sales organization were recently announced by Jeffrey Mfg. Co., Columbus, Ohio.

LINCOLN KILBOURNE, formerly manager of sales in the products engineering division, has been named to a similar post in the conveyor division. He is to be replaced by *C. G. HAWLEY*, district manager at the Jacksonville, Fla., office. *L. COLE*, sales engineer in the Columbus territory, replaces Mr. Hawley. *PAUL LAWALL*, formerly district

manager at the New York, N.Y., office, has been made manager of sales for the general engineering division. He is to be succeeded in New York by *R. W. SWEITZER*, district manager at Philadelphia. *W. K. MYERS*, of the Boston office, will replace Mr. Sweitzer in Philadelphia. *PAUL HENDRY*, Milwaukee, moves to the Boston office. In the conveyor division in Columbus, *DAN KNIES* and *A. W. LEMMON* have been named consultant sales engineers.

Promotion of four executives has been announced by Heppenstall Co., Pittsburgh. *JOHN P. ROCHE*, vice president and general sales manager, becomes executive vice president. *HARRY O. LANG*, vice president of Heppenstall Co., Detroit, a subsidiary, succeeds Mr. Roche as vice president for sales. *RAYMOND T. PORTER*, eastern sales manager, replaces Mr. Lang. *GEORGE H. WURSTER*, sales representative in the Boston area, has been named eastern sales manager.

G. H. Wurster

S. C. Lloyd

S. C. LLOYD has been appointed sales manager of the pre-engineered division of Mechanical Handling Systems, Inc., Detroit. He will supervise sales in all standard materials handling equipment.

JAMES A. MILLER has been named manager of the newly opened office of Reeves Pulley Co. in Los Angeles. He was formerly with Byron-Jackson Co. Assisting Mr. Miller will be *HARLAN M. GILLIS*, formerly a member of the Reeves engineering staff at the firm's home office in Columbus, Ind.

CARL E. ROGERS, director of marketing and public relations for the Waxed Paper Institute of Chicago, spoke on "Packaging for Profits" at a meeting of the Greater Dallas Bankers Club in Dallas, Texas, October 29.

ROBERT PARAMOUR of Central Fibre Products Co., Quincy, Ill., has been elected president of the Industrial Association of Quincy, Inc.

DR. HANS O. KAUFFMAN, director of research and development for Buffalo Electro-Chemical Co., Inc., has been chosen general chairman of the

the capacity to build BIG!

When you have a liquid storage problem that is out of the ordinary, large or small, you'll find Birtank capacity and equipment equal to your demands. Time and again paper and textile mills, refineries, chemical plants and others have turned to Birtank with their container problems.

They have learned that Birtank specializes in both large and small jobs performed satisfactorily, economically and on schedule.

Consult our engineers. Let your problems become their problems. Phone, write or wire for information.

AN INGALLS BIRTANK PRODUCT

BIRMINGHAM TANK COMPANY
DIVISION OF
INGALLS IRON WORKS COMPANY
BIRMINGHAM, ALABAMA
NEW YORK · CHICAGO · PITTSBURGH

SPECIALISTS IN THE FABRICATION OF BULK AND FIELD STORAGE TANKS—HEAVY PLATE WORK OF EVERY DESCRIPTION

121st national meeting of the American Chemical Society, which is to be held in Buffalo, March 23 to 27, 1952. Dr. Kauffman is a member of TAPPI.

Two Richmond, Va., men have been elected to posts in the Southern Division of the National Paper Box Manufacturing Association. *P. L. REED II* of Wilson Paper Box Co. was named vice president, while *WILLIAM H. WOLFE* of Consolidated Paper & Box Co. was made a director.

HAROLD W. BEDER JR. has been named general sales manager for Whitney Chain Co., Hartford, Conn. He was formerly associated with McKinsey Co., New York, N.Y., management consultants.

H. W. Beder Jr.

J. A. Morris

JOSEPH A. MORRIS has been named general manager of the new Indianapolis plant of Paper Manufacturers Co., Philadelphia converters. He was formerly head of the cost accounting department at the main office.

James P. Towey has been promoted to manager of sales for coarse paper of Crown Willamette Div., Crown Zellerbach Corp. Mr. Towey, who has been assistant manager of sales, has been with the firm since 1918.

Kenwood Dixon has been made art director for Robert Gair Co., Inc., New York, N.Y. He will coordinate the firm's art work.

William H. Sisson has been named power industry manager for Minneapolis-Honeywell Regulator Co. Mr. Sisson, now industrial manager of the firm's Indianapolis office, will promote product sales in the central station and power fields. His headquarters are to be in Philadelphia.

W. F. Cook has been appointed director of industrial relations for Kimberly-Clark Corp., Neenah, Wis. He has been the corporation's chief representative in all labor negotiations and succeeds the late Ralph Kehl. Mr. Cook joined the firm in 1928.

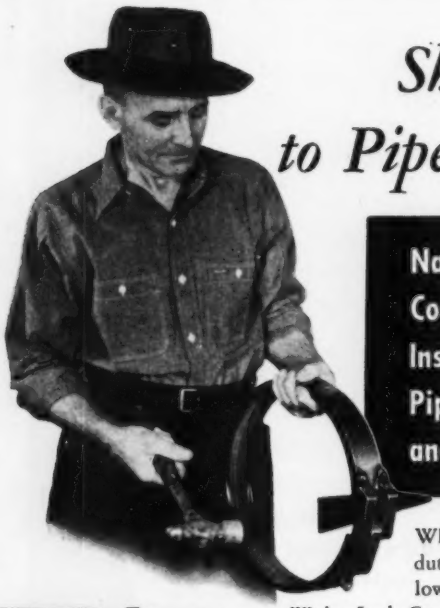
J. W. Spoor, formerly manager of the Product Service Div., has been named general sales manager of the Welding Products Div. of A. O. Smith Corp., Milwaukee. *L. F. Vonier,* who has been associated with the Milwaukee firm since 1937, has been appointed to the newly created position of sales promotion manager. Succeeding Mr. Spoor in the Product Service Div. is *Charles Smith,* formerly field service manager.

J. B. Laramy has been appointed manager of the marketing research department of Worthington Pump & Machinery Corp., Harrison, N.J. He has been assistant manager of the firm's Chicago office for the past six years.

Chandler H. Jones has been named sales manager of National Container Corp's. new $1,000,000 corrugated box plant in Dallas, Tex. He will head the firm's Southwest sales operations.

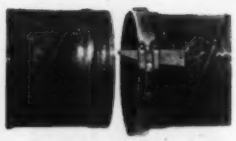
John R. Craig has joined the Midwest sales force of Nopco Chemical Co., Harrison, N.J. Associated with the firm since 1941, he will be in charge of sales in Texas and Oklahoma.

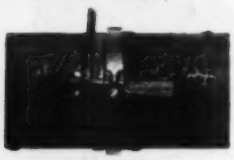
Adger S. Johnson has been appointed president of National Carbon Co., a division of Union Carbide and Carbon Corp. Mr. Johnson has been vice president and general manager of National since May 1950. He joined the firm in 1928 and was later superintendent of the company's plant at Shanghai, China.



Short Cut to Pipe Connections

Naylor Wedge-Lock Couplings Speed Installation of Naylor Pipe in Both Heavy-Duty and Low Pressure Service





Whether it's a permanent, heavy-duty installation, or a temporary, low-pressure line, there's a Naylor Wedge-Lock Coupling that's ideal for connecting Naylor pipe.

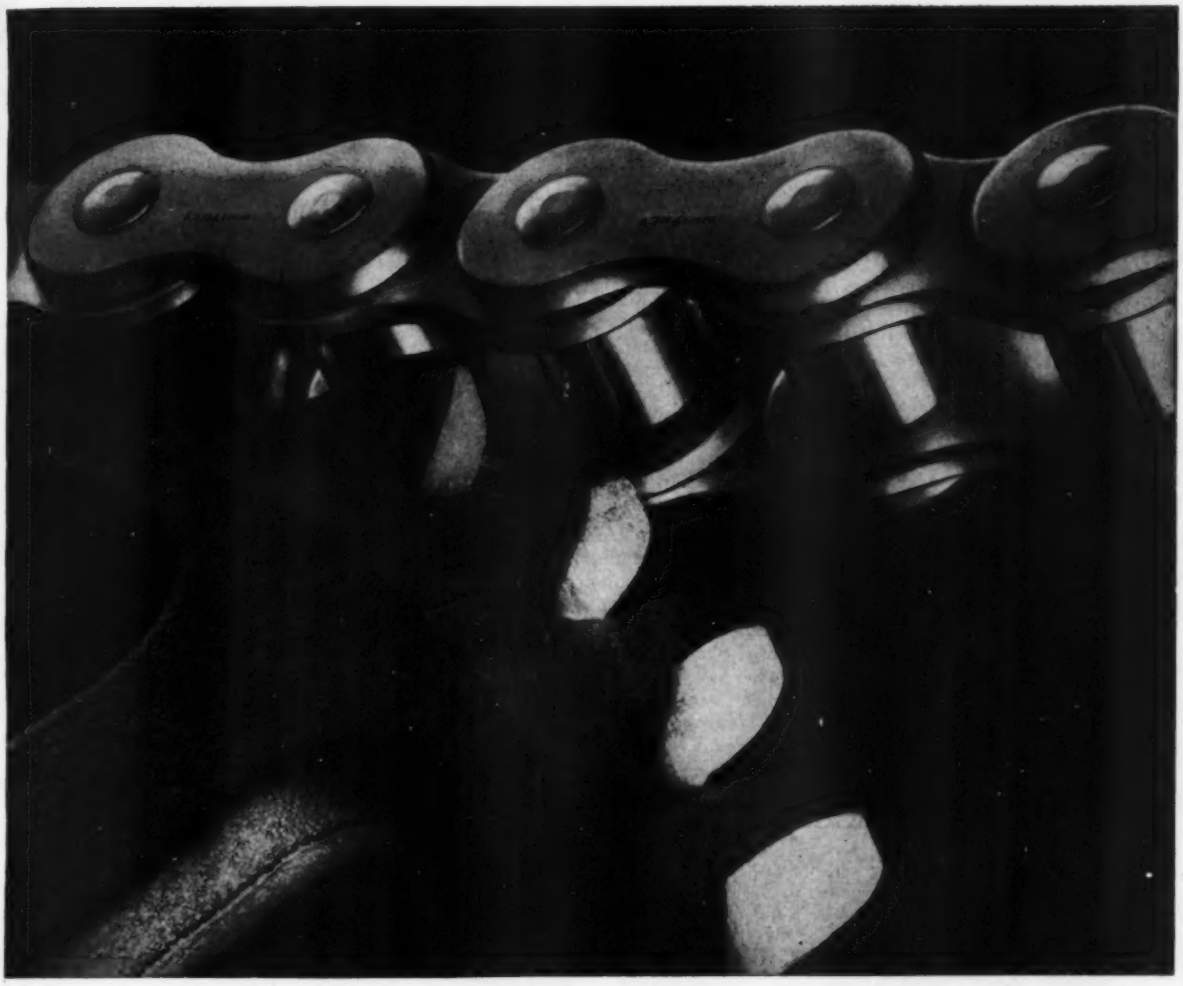
These positive type couplings are available in two types—for heavy duty and for low pressure. They provide the quickest, easiest and most economical method of pipe assembly, and a hammer is the only tool required.

The Naylor Wedge-Lock one-piece construction offers definite advantages. Joints can be made up with only one side of the line in the open. The coupling also provides for expansion and contraction. It assures tight, leakfree joints, less power loss, long service life, high salvage and re-use value. Available in sizes for light-weight pipe from 8" to 30" in diameter.

Write for Bulletin No. 513 on Heavy-Duty type; or Bulletin No. 514 for Low-Pressure Coupling.

NAYLOR PIPE

Naylor Pipe Company, 1236 E. 92nd St., Chicago 19, Ill.
New York Office, 350 Madison Avenue, New York 17, N.Y.



A Portrait of Drive Efficiency and Savings

Whitney Chain Drives cut transmission costs, provide positive grip, assure product uniformity

Here's a close-up view of a Whitney Roller Chain engaging a sprocket tooth. Examine it carefully . . . by looking a little deeper, you can see power transmission efficiency and cost reducing design elements at work. Note the finely finished alloy steel rollers settling down to a positive, yet smooth engagement with the sprocket teeth . . . that's the all-steel combination, supplying the answer to countless drive problems.

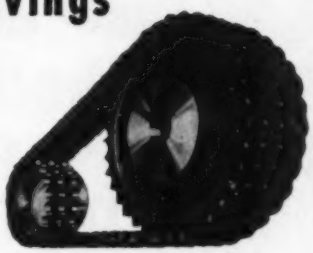
Here are some of the reasons why:

Positive Grip — Deeply seated in the sprocket teeth, Whitney Roller Chains transmit full rated horsepower without friction or slippage. This means constant machine output is maintained . . . highest transmission efficiency is always obtained.

Versatility and Adaptability — Because these roller chains operate on long or short centers, drive shafts clockwise or counterclockwise — separately or simultaneously, they simplify design problems, cut costs of complex drive mechanisms.

Quality — The acceptance of "Whitney" as a quality standard by designers of modern machines is the result of decades of chain making. Alloy steel parts are durably made — precisely assembled to stand up under the severest of operating conditions.

Whitney products are readily available through a nation-wide network of Whitney Distributors and Warehouses. Call the one nearest you for prompt service. For engineering assistance and catalogs write:



OTHER WHITNEY PRODUCTS

- Silent Chains — for smooth, high speed power transmission
- Conveyor Chains — for modern material handling
- Flexible Couplings — for positive but flexible direct drives
- Cut Tooth Sprockets — for smooth engagement, long life

WHITNEY CHAIN COMPANY

236 Hamilton Street, Hartford 2, Conn.

The Paper Industry Necrology

Charles J. Kay

Pioneer in Western Canada's paper industry, *Charles J. Kay,* retired president and founder of Columbia Paper Co., died recently in Vancouver, B. C. Mr. Kay, who began his career in 1911, was well known and respected in the industry. He was named Vancouver's "Good Citizen" in 1941 as a result of his social, welfare, and philanthropic activities.

Winburn G. Currie, 55, a salesman for Tayloe Paper Co., Memphis, died at Jackson, Tenn., November 7. He at one time was associated with Currie-McGraw Co. of Memphis, of which his uncle, the late Jesse Currie, was president.

Robert K. Zaumeyer, 51, former manager of the Lakeview mill of Kimberly-Clark Corp. at Neenah, Wis., and more recently associated with the firm's plastic division sales department, died October 19 after a long illness. He joined Kimberly-Clark as a chemical engineer and served the company in Niagara Falls, N. Y., and in Kimberly and Neenah, Wis. During World War II he was chief of the technical division of the paper section, War Production Board.

James W. Krantz, 33, field service representative of Black-Clawson Co., Hamilton, Ohio, died October 15 in Claremore, Okla. At the time of his death he was directing the erection of the paper machine being installed at the new Pryor, Okla., plant of National Gypsum Co. Mr. Krantz joined Black-Clawson in 1946 as a fitter in the assembly department.

Wilson J. Field, 51, recently named general manager of the Raisin-Thiebaut Div. of Bemiss-Jason Corp., San Francisco, died October 11 at his Orinda, Cal., home. He was also president of Custom Paper Products. Mr. Field was formerly associated for 20 years with Fleishhacker Paper Box Co., first as a salesman, then as sales manager, and finally as vice president and general manager.

Stanford H. Hartshorn, 61, treasurer of C. H. Hartshorn Co., Inc., and formerly associated with Great Northern Paper Co., as a chemist, died October 23 at a Boston hospital. He was a former president of the Gardner, Mass., city council.

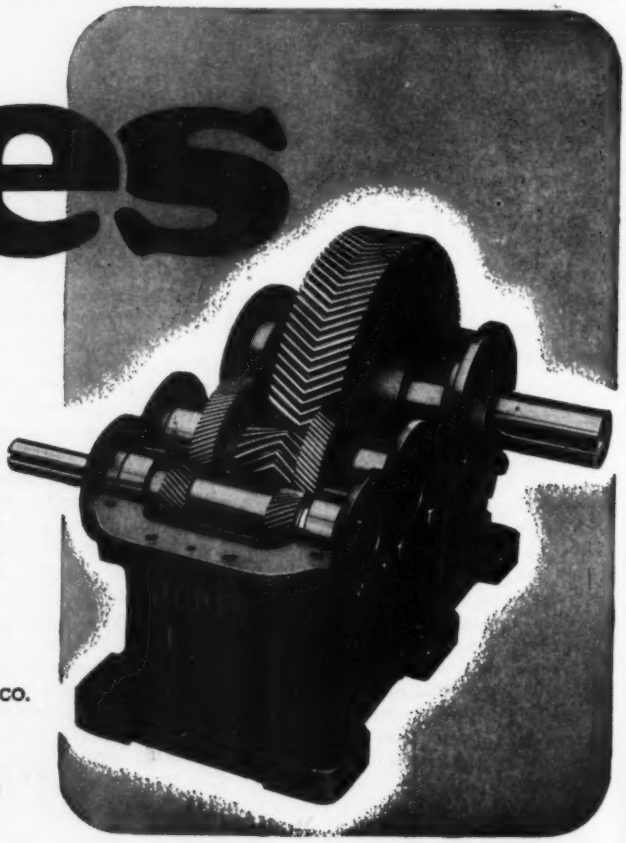
James F. Macksey, formerly sales manager for Robert Gair Co., New York, N. Y., and later eastern sales representative of Cavu, Inc., Pasadena, Cal., died October 21 at his home in Montclair, N. J.

James Henry Mack, who had been a Great Northern Paper Co. agent for a number of years, died November 1 at East Millinocket, Maine. He had been chairman of the selectmen of East Millinocket for 32 years and was a state representative from 1931 to 1935.

George Scherff, 78, retired chief auditor of Union Sulphur Co., New York, N. Y., died at Port Chester

Jones

Herringbone SPEED REDUCERS—



. . . are built in single, double and triple reduction types. Symmetrical gear arrangement provides balanced loads on liberally proportioned bearings. Housings are substantially constructed, well ribbed and have generous pads for foot bolts.

The method of selecting these reducers with complete horsepower and dimension tables is shown in Catalog 70.

Since 1890 Jones In The Service Of Industry

W. A. JONES FOUNDRY & MACHINE CO.
4439 Roosevelt Rd., Chicago 24, Ill.

Herringbone — Worm — Spur — Gear Speed Reducers
Cast Iron Pulleys • Cut Gears • V-Belt Sheaves
Anti-Friction Pillow Blocks • Flexible Couplings

Our Wish for You

is a

Christmas attended by happiness

and a

New Year attended by prosperity.

THE LINDSAY WIRE WEAVING COMPANY

14001-14299 Aspinwall Avenue • Cleveland 10, Ohio

Lindsay **WIRES**

FOR PAPER MILLS

Paper Mill Engineers!

GET THE VALVE THAT MEETS YOUR SPECIFIC NEED

Designed to control the flow of heavy solutions of paper stock with a minimum of maintenance. Made from all types of stainless steel, monel or any combination. Contact nearest agent.

AGENTS:

SOUTHERN CORPORATION
Charleston, S. C.

M. J. GIGY & ASSOCIATES
San Francisco, Cal.

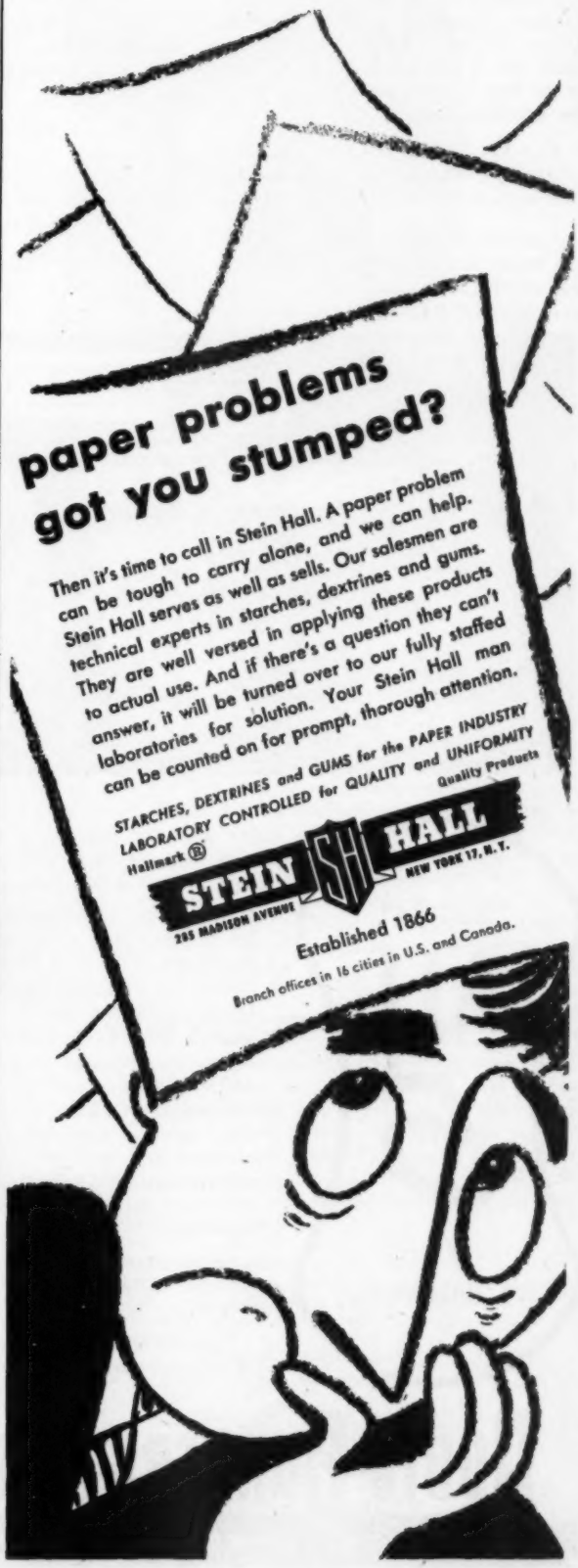
JOHN B. ASTELL & CO.
New York, N. Y.

NORTHWEST COPPER WORKS, Inc.
Portland, Ore.

THOS. W. MacKAY & SON, Ltd.
Vancouver, B. C.

FABRI-VALVE CO. OF AMERICA

2100 N. Albina Ave., Portland, Oregon



paper problems got you stumped?

Then it's time to call in Stein Hall. A paper problem can be tough to carry alone, and we can help. Stein Hall serves as well as sells. Our salesmen are technical experts in starches, dextrines and gums. They are well versed in applying these products to actual use. And if there's a question they can't answer, it will be turned over to our fully staffed laboratories for solution. Your Stein Hall man can be counted on for prompt, thorough attention.

STARCHES, DEXTRINES and GUMS for the PAPER INDUSTRY
LABORATORY CONTROLLED for QUALITY and UNIFORMITY
Hallmark ® Quality Products

STEIN HALL

285 MADISON AVENUE NEW YORK 17, N. Y.

Established 1866

Branch offices in 16 cities in U.S. and Canada.

October 30. He retired in 1944 after 40 years' service.

J. Fred Wilson, 74, retired secretary and treasurer of Ingram Paper Co., died October 25 at his home in Sky Forest, Cal. A resident of South Pasadena 38 years, Mr. Wilson joined the paper firm at the time of its organization in 1925. He retired last July.

Carl Robert Anderson, 49, treasurer of Michigan Carton Co., Battle Creek, died early in October.

James Henry Gundy, Canadian financier instrumental in developing the pulp and paper industry, died November 10 in Toronto. He was 71. Mr. Gundy was a director of Howard Smith Paper Mills Ltd., Abitibi Power & Paper Co. Ltd., and Dominion Gas & Chemical Co.

George A. Meledin, 25, foreman for Ohio Box Board Co., died October 9 while being rushed to a Pittsburgh, Pa., hospital.

Frederick E. Williamson, 77, vice president and a director of Consolidated Paper Co., New York, N.Y., died November 11. He had been associated with Consolidated since 1921.

Wade W. Dauch, 47, director of Hinder & Dauch Paper Co. at Sandusky, Ohio, died November 10. He was formerly an associate professor in law at Western Reserve University.

Charles Henry Dyke, 69, operator of paper mills in the Midwest, died October 12 at his residence in Monrovia, Cal.

Frank J. Menke, 74, founder and retired president of American Paper & Woodenware Co., Cincinnati, died October 10. He retired from business three years ago because of ill health.

Harry N. Dare, 60, of Kansas City, Mo., died October 2. He was a city sales representative for Western Envelope Mfg. Co. and had been with the firm 25 years.

Norman W. Allis, 56, New York sales manager for S. K. Smith Co., died October 16 in his office. He had been with the firm 15 years.

James G. Aitchison, 60, machine superintendent at Chemical Paper Mfg. Co., Holyoke, Mass., died October 9 in Boston. He had been associated with the firm for 30 years.

George A. Vradenburg, 69, former president and treasurer of American Paper Bottle Co., which he helped form in the early 1930s, died September 18.

John P. Roberts, 43, assistant general manager of Timken Roller Bearing Co., Service Sales Div., was killed in an automobile accident near Spruce Pine, N.C., September 19. He had been with the firm since 1935. The wife and a daughter survive.

Thomas E. Morris, 90, of Waukegan, Ill., died in his home October 13. He was manager of U.S. Envelope Co. in Waukegan until his retirement in 1945.

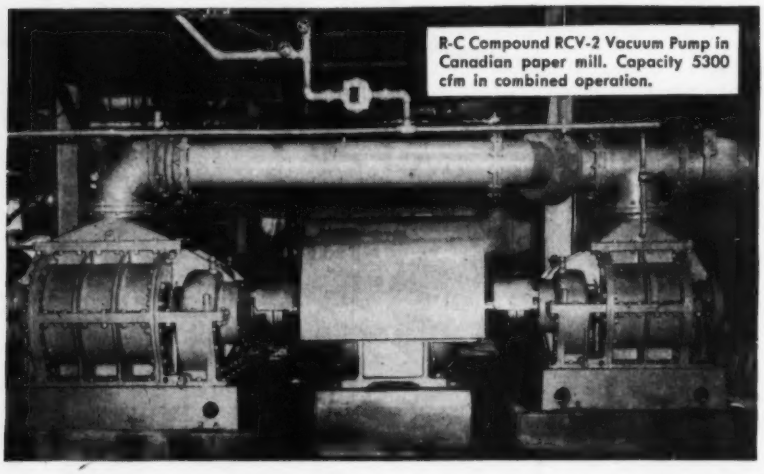
Horatio W. Lewis, president of H. L. Lewis & Co., stationery manufacturers, died October 8 at his home in East Orange, N.J.

Allen B. Friedman of San Francisco, who owned about 75 per cent of the stock of Atlas Paper Co., was found dead in his home October 1.

Ramsay Jackson, formerly of Pittsburgh, who owned and operated Ambridge Wallpaper Co. for 30 years, died October 11 in Sewickley Valley Hospital. He was 82.

George W. Shannon, 80, formerly a director and vice president of Robert Gair Co., Inc., New York, N.Y., died September 25 in a Brooklyn Hospital. He began his career as a salesman with the Gair Co. in 1903 and was active until two weeks before his death.

Hugh J. Craig, a salesman for Sabin Robbins Paper Co., Buffalo, N.Y., died at his home October 7 after a long illness. He was 32.



YOU GET
ALL
5
IN R-C
VACUUM PUMPS

Many years of outstanding performances have proved the sound values of R-C Cycloidal Vacuum Pumps, with these 5 important features:

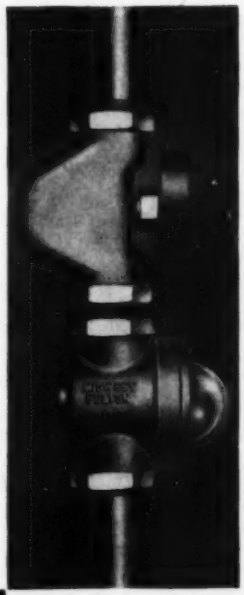
1. **LOW POWER CONSUMPTION**—because units are recommended, either single or compound, to operate at the most efficient point.
2. **NEGLIGIBLE FRICTION LOSSES**—no contact between impellers or impellers and casings.
3. **HIGHER SPEEDS**—permitting direct connection to standard motors, saving first cost, space and weight.
4. **FLEXIBILITY**—to meet varying demands; suction automatically overcomes resistance in system.
5. **DEPENDABILITY**—long-time, attention-free operation, due to simplified design and construction.

Ask for details on R-C Vacuum Pumps and other equipment to handle gas and air in paper mill operation.

Roots-Connersville Blower Corporation
510 Monroe Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE
BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

A Sight-Flow Indicator
that Really Works



The Midwest Ball Sight-Flow is the one and only dryer condensate indicator with a "Window" that really stays clear—is constantly being scoured and kept clean by the violence of the liquid as it passes. The thousands already in use on both wet and dry end dryers prove that statement.

Flow visible from front and both sides. Installation in discharge line either vertical or horizontal.

Equip your dryers, particularly the wet end section, and keep tab on condensate flow. Add Midwest non-corrosive temperature indicator to help you spot subnormal temperatures.

Sight-Flow fitting all bronze and non-corroding. Glass ball of heavy Pyrex glass and replaceable. Assembly effective for steam pressures up to 75#. Standard pipe sizes ½", ¾", 1", 1¼", 1½". Temperature indicator also non-corroding.

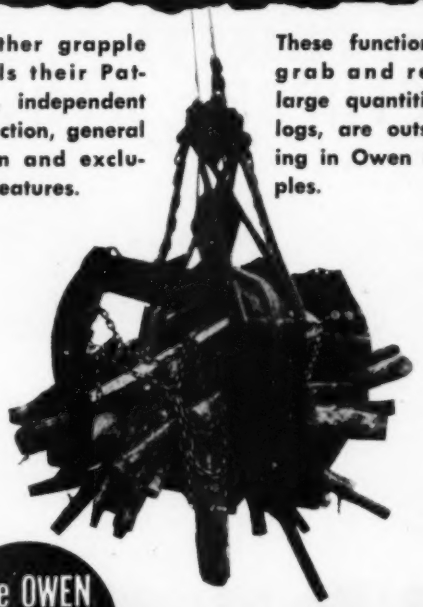
Order several now and you'll order more later. They do the work or we take them back.

Midwest Fulton
Machine Company **Dayton • Ohio**

To GRAB and to HOLD

No other grapple equals their Patented, independent tine action, general design and exclusive features.

These functions, to grab and retain large quantities of logs, are outstanding in Owen Grapples.



The OWEN *Pulpwood* GRAPPLE

The Owen Bucket Co.
6015 Breakwater Ave. • Cleveland, Ohio
Branches: New York, Philadelphia, Chicago, Berkeley, Calif.

THE RIGHT COMBINATION

Layne offers you the right combination of unmatched experience plus modern equipment for installing well water units of any size—and for any purpose. Layne has made more water supply installations than any other firm in the entire world, and this valuable experience places Layne in a position to unquestionably do every job exactly right. Once the installations have been made, a complete record of everything is kept; strata formation, sand porosity, casing details, sand screen length, diameter and metal used, all pump information including bearings, shafting, impellers and operating characteristics. With such information, Layne is always in a position to give quick and most economical service for adjustments or repairs if and when needed.

Everything by Layne

Layne accepts your contract for furnishing everything; Layne supervision, Layne drill crews, Layne drill equipment, Layne designed and Layne built louver type sand screen and Layne high efficiency vertical turbine pumps. No other firm is involved, therefore there is no divided responsibility. This plan gives you the very finest well water supply units that world wide experience and skill can possibly design and build.

Layne offers a wide range of fully illustrated catalogs covering all phases of well water installations for all types of industry. Write for more information.

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

Layne
WATER SUPPLY
WELLS & PUMPS

Foreign Abstracts . . . . . .

Sulphite pulping properties of spruce from floated, unpeeled logs

This is the first paper in a series from the Swedish Forest Products Research Laboratory in Stockholm and deals with the catechol tannins on the surface layer of sapwood, from floated, unpeeled sprucewood logs. Wood from such logs which have been in water for several months give abnormally high screenings in the sulphite digestion (causing pulp losses of 2-5 per cent) (as gauged by yields from unfloated logs, or logs peeled prior to floating). This is due to the outer sapwood layer (about 0.5 cm. in depth) which if chipped separately may give 20-40 per cent screenings.

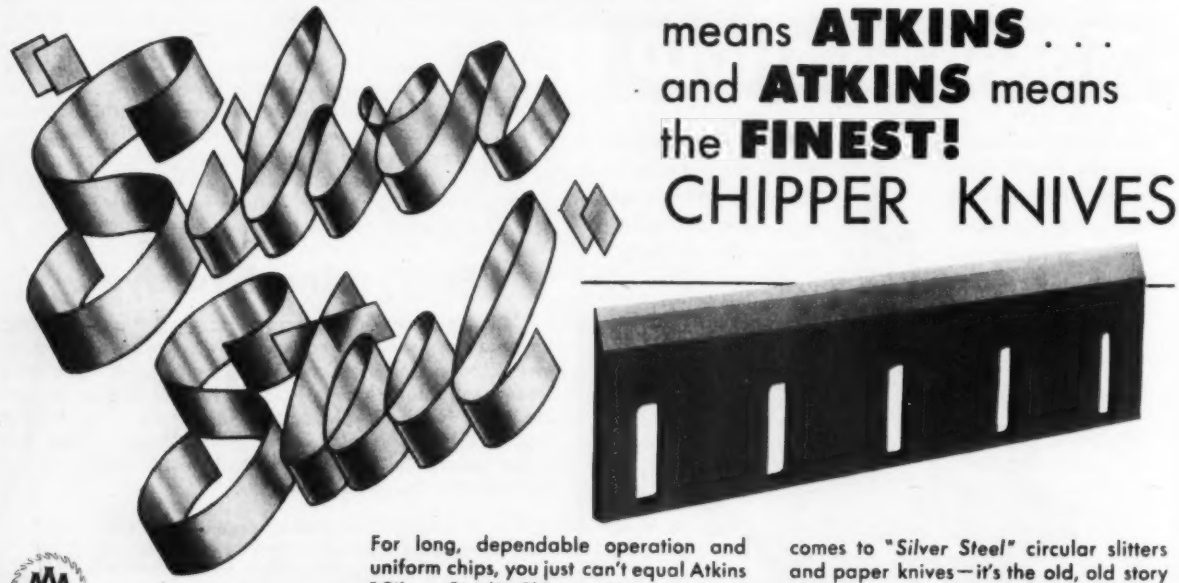
A characteristic color reaction of these (outer) chips is an intense violet color with concentrated sulphuric and methanol, which is due apparently to catechol tannins. Similarly, the Isenberg-Buchanan reaction (a violet color with concentrated hydrochloric and methanol) is due to these components. These tannins emanate from the bark and enter the sapwood during flotation. The color reactions are analogous to the well-known lignin-phloroglucinol reaction and apparently depend on a condensation product between the "coniferyl aldehyde" groups of the lignin with the polyphenolic tannin. For example, when the *extractives* from the spruce bark (or the contiguous sapwood) were treated with coniferyl aldehyde (or its methyl ether) and a mineral acid, similar color reactions were developed. Hydrolyzable tannins, and flavanones and flavones all fail to give this color reaction with coniferyl aldehyde. These findings serve to substantiate the findings of Erdtman. The authors give light absorption spectra of various preparations. Erich Adler. *Svensk Papperstidn.*, *54*, 445-450 (1951). (Original in English with German and Swedish summaries).

Wet Strength Papers

A series of wet strength papers (especially those used for wrapping and packaging and in bag manufacture) both untreated and treated with a formaldehyde-urea resin (*I*) were tested (dry and wet) for tensile, burst, initial tear, internal tear resistance, and resistance to rubbing ("Abriebfestigkeit") (*II*). A new apparatus for determining *II* is described and illustrated. In general more than 4 per cent *I* showed little improvement in the strength properties of wrapping paper except in the case of *II*. The addition of *I* even in relatively small amounts greatly improved the burst, tear and *II* of a heavy sack (made from soda pulp). In a bag paper (containing sulphite pulp) *I* also increased the wet strength properties markedly when impregnated up to 7 per cent *I*. Internal tear of the dry paper, however, decreased markedly with increasing amounts of *I*, and (dry) burst also decreased slowly with rising per cent *I*. Impregnation of cardboard containing groundwood with 4 per cent *I* and 5 per cent paraffin showed marked increases in wet tensile strength and in *II*. Results are tabulated and also shown graphically. I. G. Reich. *Allg. Papier-Rundschau* 1951, 587-94 (In German).

Study on the permeability of paraffin papers

A study was made of the permeability (*I*) to water vapor of paraffined papers. The factors controlling *I* are temperature and relative humidity (R.H.), paper quality, and the nature of the impregnating agent. Tests were carried out at 5 per cent and at 92 per cent R.H., at 100 F. Tables indicate the great variations in *I* with untreated paper on the one hand and paraffined papers (from the same stock) on the other. The influence of weight of material used in paraffining (per sq. m.) of paper, the effects on *I* of wax (*II*) versus paraffin (*III*) (which indicates that *II* was less effective than *III*); and the marked effects of folding on *I* (depending largely on the plastic flow of *II* or *III* used) are also discussed. Although *II* is actually less effective than *III* in decreasing *I*, papers treated with *II*, when folded

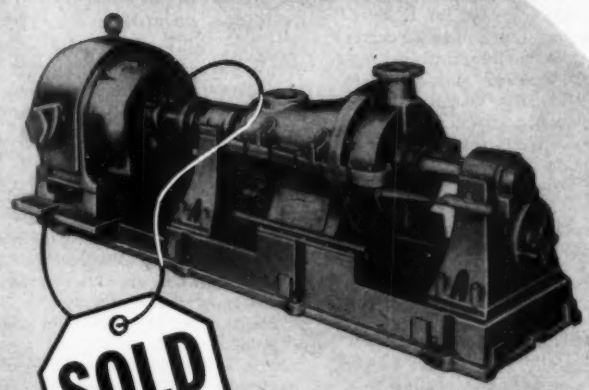


For long, dependable operation and uniform chips, you just can't equal Atkins "*Silver Steel*" Chipper Knives! Many mills have told us so! . . . And when it comes to "*Silver Steel*" circular slitters and paper knives—it's the old, old story that top quality means top value, and ATKINS stands for both!

E. C. ATKINS AND COMPANY • 402 S. Illinois St., Indianapolis 9, Ind.

ATKINS

SUCCESS STORY



E.D. Jones

More units sold of this "mighty mite of stock preparation" than of *any* other refiner . . . anytime, anywhere: that's the success story of the Jones HIGH-SPEED REFINER.

The reason? In installation after installation, this Refiner has chalked up impressive power savings — while giving better preparation of stock, more flexibility and better control.

Ask your Jones representative how it can improve your stock preparation, or write for Bulletin 1011B.

E.D. Jones

**NOT counting those made by imitators.*

HIGH-SPEED REFINER

E. D. JONES and SONS COMPANY • PITTSFIELD, MASSACHUSETTS

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

ORISKANY WATERBURY FELTS

MADE BY

H. WATERBURY & SONS CO.

ORISKANY, N. Y.

SULPHITE MILL ACID PLANTS

Sulphur Burning Plants • Jenssen Two Tower Acid Systems • Gas Coolers—Surface and Spray Type • Jenssen Pressure Acid Systems • Jenssen Auxiliary Process Towers • Recovery Plants—Cooking Acid

SOLUBLE BASE ACID PLANTS
SEMI CHEMICAL PLANTS
JENSSEN SO_2 ABSORPTION SYSTEMS

FOR BLEACH PLANT APPLICATION
SULPHUROUS ACID PREPARATION

G. D. JENSSEN CO., INC.
WATERTOWN, NEW YORK
WESTERN REPRESENTATIVE:
JAMES BRINKLEY COMPANY, Seattle, Washington
FOUNDED 1915

ENGLISH ECCO CLAYS CLAYS

ECCO CLAYS TRADE MARK

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

showed a smaller percentage decrease in *I* than did those treated with *III*. The best results in *I* were obtained when papers were treated with mixtures of *II* and *III*, in which two sheets were laminated together by means of the *II-III* mixture. A treated paper is considered satisfactory when *I* is less than 15.5 g. water per sq. m. per 24 hours, and which on folding shows a decrease in *I* of less than 30 per cent. A. Kreyenbuhl. *Bull. assoc. tech. de l'ind. papetiere*, 5, 257-263, discussion 263-4 (1951) (In French).

Stress-strain characteristics of paper

The influence of temperature on the stress-strain characteristics of paper was studied over a temperature range of minus 50 C. to plus 150 C. Samples of newsprint and machine glazed kraft were investigated. The slope of the stress-strain curves and of the tensile strength both decreased with rising temperatures. Inasmuch as there was no sound, purely theoretical basis for interpreting their results, the authors made an empirical interpretation in which the following equation was used:

$$\sigma = (A\epsilon + B\epsilon^2) + (C\epsilon + D\epsilon^2)t$$

where σ is the stress in kg.; ϵ is the strain (in percentage elongation), t is the temperature in degrees C., whereas A, B, C, and D are constants. Similarly, linear equations were fitted to the breaking stress-, and breaking elongation-temperature data.

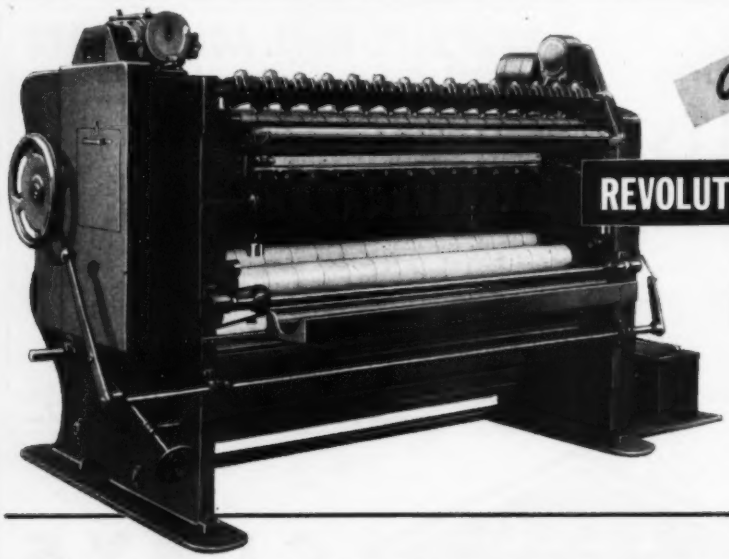
Statistical analysis of stress-strain temperature experiments has indicated that linear relationships can be used with a high degree of accuracy. The influence of humidity on the stress-strain characteristics of the newsprint and kraft paper was also studied. The entire humidity range was applied. Sorption isotherms were determined, allowing the data to be compared as a function of the water content. A rapid change in shape of the diagram was noted at humidities between 60 and 80 per cent. Contrary to earlier work, no maximum point was found in tensile strength at an intermediate relative humidity. Elongation curves in the cross-machine direction increased rapidly with relative humidity, but tended to level off at high humidity. The initial slope of the stress curve followed closely the trends shown for breaking stress. Near (and after the saturation point) the influence of water is not as marked as at lower moisture contents; a total of 41 graphs are given. Olle Andersson and Edward Berkyto. *Svensk Papperstidn.*, 54, 437-444 (1951). (Original in English, with German and Swedish summaries).

Manifold paper; its evaluation

Manifold paper (*I*) is that on which carbon copies are made, and the author reports studies on numerous brands of *I*, in the hope of achieving the most favorable results on typing. Thus, the same typist, using only one typewriter, made a series of practical tests. The whiter and the more completely closed was the surface of *I*, the more legible were the carbon copies. The most satisfactory *I* had a finish that was neither too smooth nor too rough. When few carbon copies were to be made, a basis weight in *I* of 40 g. per square meter was preferred, but in general *I* (without mechanical pulp) of 30 g. basis weight was considered standard. However, when eight or more copies were required 25 g. or less in *I* proved suitable. Various tests for evaluating the quality of *I* are outlined. Hans Kotte. *Das Papier* 5, 212-17 (1951) (In German).

New water-soluble cellulose complex

Despite earlier unsuccessful attempts by Traube to obtain cobalt-ethylenediamine complexes with cellulose, the present author was able to achieve this result when certain precautions were adhered to. A reactive greenish-blue cobalt hydroxide ($Co(OH)_3$) (*I*) was prepared by using cobaltous chloride and less than the theoretical amount of ammonia. The freshly prepared *I* was dissolved in 50-55 per cent ethylenediamine (*II*) giving rich wine colored solutions. Oxygen must be carefully excluded and the formation of precipitates must be avoided. Solutions richer in cobalt could be obtained by adding small amounts of glycerol or tartaric acid to *II*, thus serving to depress precipitation. A clear solution containing 6.8 per cent cobalt, 26.6 per cent *II* and 1.7 per cent glycerol was capable of dissolving approximately 7 per cent cellulose (such as that present in dissolving pulps). These cellulose solutions were clear, red and highly viscous. The author assumes that the cobalt solution contains $Co(en)_3(OH)_3$ (en = *II*), and that the cellulose complex is probably $(C_6H_7O_6Co)_2(Co(en)_3)$ (although his analyses are actually lower in cellulose). George Jayme. *Das Papier* 5, 244-51 (1951). (In German).



Cuts Perforates Slits

REVOLUTIONARY, NEW ROLL WINDER

Counts Automatically

WITH 25-50% GREATER PRODUCTION SPEED

• SHARP, CLEAN EDGES
• NO LINT OR FUZZ
• 100% ACCURATE COUNT

THERE'S no lost motion with the 60-B new, *continuous* toilet roll winder. Operator simply places uncut core on shaft at number one station and removes completed rolls which have been cut, perforated and accurately sheet counted, from the number two station. After displacing rolls, operation is repeated. Each full cycle produces a minimum of 10 standard 4½" rolls on a 45" machine or 18 similar rolls on an 81" machine. Winder is also designed for roll towel and other paper products production. Simplified mechanical operation assures smooth running with a minimum of wear on all running parts. This same steady, even motion produces rolls of uniform appearance and bulk. Write for further information and complete specifications.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS
Manufacturers of
Printers, Embossers, Folders, Interfolders, Waxers, Laminators, Wrapping Machines, Core Winders, Packaging Presses, Crepers and Napkins, Toilet Tissue and Paper Towel Units.

HANCHETT 6K

KNIFE GRINDER

OTHER MODELS

DN FOR LIGHT PRODUCTION CAPACITY 32" to 108"

AK EXTRA-HEAVY DUTY

FAMOUS TRAVELING WHEEL HEAD GRINDER. Hydraulic and Mechanical Transmission Drive. Capacity 84" to 360" and longer. Speeds 10' to 100' per minute—Faster speeds if required. 3-Month Delivery in all lengths.

World's Largest Manufacturers of Knife and Shear Blade Grinders . . . Famous RED ANCHOR Grinding Wheels—Segments—Dressers—Cutters—Compound.

TABLE DRIVE

HYDRAULIC

ELECTRICAL

Full Automatic

SPEEDS FROM 10 to 80 FT. PER MINUTE

Faster Speeds If Required

CAPACITY 32 to 184 inches

HANCHETT MANUFACTURING CO.

Main Office: BIG RAPIDS, MICH.

West Coast: PORTLAND, ORE.

POOLE

A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

PHOTOVOLT

Photoelectric REFLECTION METER

for accurate measurement of

Brightness and Opacity

of pulp and paper in terms of TAPPI specifications. Also for

Gloss and Color

tests on paper, cardboard and other paper products.

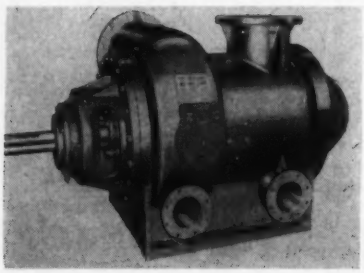
Portable, reliable, rugged, simple to operate

PHOTOVOLT CORP.

95 MADISON AVE. NEW YORK 16, N. Y.

Also: Colorimeters, pH Meters

The Paper Industry New Products



Defibering breaker trap

An efficient method to overcome the clogging of control valves from tramp metal and over-size particles has been a paper industry problem for some time, and the Sutherland Breaker trap was designed specifically to solve this need for selective defibering and removal of tramp metal. Although developed first in connection with high yield pulp systems, it has a wide application in the semi-chemical and waste-paper fields. Since Jordans are unsatisfactory for this use because of excessive power consumption, the breaker is much more economical using from 50 to 200 hp. It is installed between the pulp storage and subsequent equipment, operating at the capacity of the following equipment. Up to 350 tons per day are handled by the machine. *Sutherland Refiner Corp., Trenton 8, N.J.*

Processing Pump

This oil-lubricated bearing, pedestal-mounted pump is designed and built for handling chemicals, liquors, corrosive materials and solutions, hot liquids, and petroleum. The liquid end of the pump is a complete self-contained unit. It can be had in stainless steel, monel metal, nickel, or other special material when used for pumping liquids which would attack iron or bronze. The pedestal is of cast iron construction with two anti-friction bearings supporting the pump shaft. Two sizes of pedestal assembly cover the entire range of pump sizes available in capacities to 1200 gpm. at heads to 250 ft. and temperatures to 500 F. *Allis-Chalmers Mfg. Co., General Machinery Div., Milwaukee 1, Wis.*

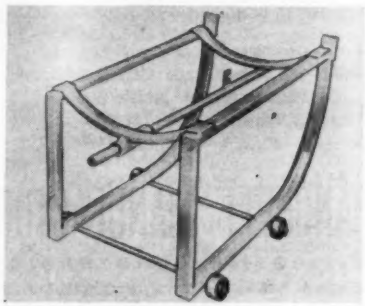
Dry scrubber purifier

This purifier with two-stage separation provides vapor quality of 1.0 PPM solids or less. It provides internal upflow operation in pressure vessels such as steam drums, eliminates the need for auxiliary baffles within the drum, and utilizes the motion of the vapor as a means of separating moisture and entrainment. Due to the non-restrictive design using tangentially-located tuyere vanes to create high-velocity centrifugal action, the dry scrubber purifier is said to perform with almost complete absence of pressure loss. The unit is designed with simplicity and contains no filter element or moving parts. These features combined with the self-cleaning action of the dry scrubber purifier eliminates any need for maintenance or servicing, according to the manufacturer. *The Centrifix Corp., 3608 Payne Ave., Cleveland 14, Ohio.*

Redesigned fork-lift truck

There are a number of added features on the Clark electric fork lift truck to provide easier operation, greater safety and improved maneuverability. Among these are the "fingertip" control lever on the steering column to make possible the selection of direction of travel and the engagement of the first point of power simultaneously; the automatic acceleration to eliminate jerky movement from one point of power to another; and a "no-kick-back" steering axle which is pivoted on rubber torsional bearings. Other improvements include a brake which sets automatically when the driver leaves his seat, smaller turning radius for greater maneuverability, and a completely redesigned battery compartment to facilitate charging, servicing, and removal of the battery. Standard equipment includes cushion tires and a cushion seat with backrest.

Electric carloader Model 4024 with these improvements has a 4,000-lb. capacity and model 5024 has a capacity of 5000 lb. *Clark Equip. Co., Industrial Truck Div., Battle Creek, Mich.*



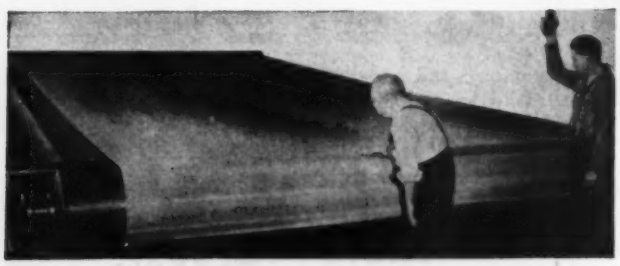
Drum cradle

An exclusive "loading-bar" permits loading of drums with greater safety on the GS steel barrel cradle. It is also designed for the storing and draining of drums and barrels at reduced handling costs and handling time. *General Scientific Equip. Co., 2700 W. Huntingdom St., Philadelphia 32, Pa.*

Accurate Flow Meter

The functional design of the Brown flow meter features the advantages of an evenly graduated meter scale and electronic integration to meet the requirements for accurate flow measurements. This differential type meter, easily installed, is supplied in three ranges: 53, 119.25 and 212 inches of water, and for 750 and 1,500 psi. static pressure. For dry calibration the three

Two of the Men Behind Eastwood Wires—John Lancaster and Clarence Reed

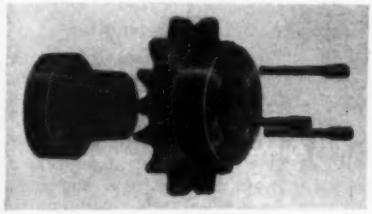


TEAM UP FOR THE "BIG STRETCH"

Here is a fourdrinier wire getting its final conditioning on the "stretching table". Only molten metal, *centrifugally cast*, weeks ago in our foundry, the many and varied skills in our large, completely integrated plant have transformed the alloys into a uniformly-woven wire that will enable some fine mill to maintain its reputation for top-quality paper.

EASTWOOD - NEALLEY CORPORATION • Belleville, N. J.

ranges are slightly greater. Available either as a mechanical flow meter with integral recorder or as an electrical transmitter to be used with Brown inductance bridge receiver. *Minneapolis-Honeywell Regulator Co., Brown Instruments Div. 4494 Wayne Ave., Philadelphia 44, Penna.*



Interchangeable hub for sheaves and sprockets

Taper-bored to receive the tapered hub, this interchangeable sprocket will fit the "QD" V-belt sheave hub without reboring on sprockets as well as V-sheaves. Bolts are provided to pull the sprocket onto the split hub for a tapered drive assembly and a positive press fit on the shaft. More speedily changed than the conventional type, these sprockets are stocked at the factory in ½ in. pitch through 1¾ in. pitch. *Fort Worth Steel and Machinery Co., Fort Worth, Texas.*

Loading deflector

Truck and car loading can be made more nearly automatic with the Wilkie deflector. The only labor required is for stacking cartons as they are automatically delivered to a stacking point. The deflector, attached to the platform end of the telescoping portable conveyor, automatically guides cartons off the permanent belt conveyor, as shown in the cut, at 90 deg. onto the portable telescopic conveyor which extends into the truck, trailer or box car. Both right hand and left hand deflectors are supplied to take care of removal to either side.

Advantages, other than the all-important one of fully automatic operation to the stacking point, include no weight adjustments needed when conveyors are shortened or extended, one man can set up the system in a few minutes, equipment is readily mobile and can be used anywhere on the loading platform, loading in minimum time at minimum labor. *Wilkie Co., 5520 Arch St., Philadelphia 39, Pa.*

Varidrive motor brake

Fast, controlled braking of U.S. Varidrive motors makes them ideal for inching or jogging, offers instant, shockless operation without noise, and produces a constantly increasing torque during stopping. The break, a Warner type ICB with a mechanical movement of only 1/16 in., is mounted directly on the variable speed shaft, eliminating transmission of the braking action

Then we dismantled the unit

. . . FOUND IT AS GOOD AS NEW

- Unit 9B16-213, for 15 months of day and night outdoor service, was operated beyond its rated capacity to meet unforseen demands. It was replaced by a larger Standardaire Blower. The engineer of this plant asked that the hard working unit be sealed and returned to our factory so that he personally could observe the dis-assembly and measurements for wear.
- Main and Gate Rotors like new —interior of blower completely dry and free of oil—no wear in other internal parts.
- Timing Gears on Gate and Main Rotors—wear very slight—no increase in back lash could be detected.
- Axial clearance of Main Rotor Shaft Thrust-Radial Bearing, increased less than .0005"—other bearings in perfect order.
- Even at the extremely high peripheral speed of these gears, they were found to be very quiet in service.
- Standardaire Blowers are sturdy —precision built units with proved staying power.

Write for specific data—Dept. E65, Read Standard Corporation, 370 Lexington Ave., New York 17, N. Y.

AXIAL FLOW STANDARDAIRE BLOWER

BLOWER-STOKER DIVISION

READ STANDARD CORPORATION

NEW YORK · CHICAGO · ERIE · YORK · LOS ANGELES

through the belt. The braking torque, once set, is permanent. Adaptable to both U.S. Varidrives and Varidrive-Syncrogears, it is D.C. actuated with low pore requirements of 25-35 watts, but power conversion units are available where A.C. voltage is supplied. *U.S. Electrical Motors, Inc., 200 East Slauson Ave., Los Angeles 54, Calif.*

Detergent

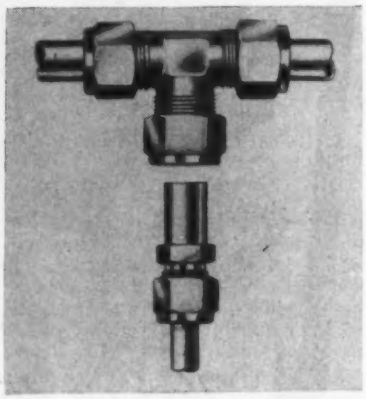
In the cleaning field, an industrial detergent, called Kreelon CD, has been developed that is reportedly superior in cleansing activity and whiteness retention to any other compounded cleaners. This product, actually an integral mixture combining Wyandotte's Kreelen and Carbose, is useful in such operations as commercial cleaning, scouring, kier boiling, after-soaping, etc., imparting superior soil removal properties, providing greater prevention of soil redisposition, and offering brighter color. *Wyandotte Chemicals Corp., Wyandotte, Mich.*

Electronic testing instrument

Several accessories have been added to the Instron Tensile Tester, an instrument based on the electric strain gage principle to detect variations of load in the specimen under test, which increase its versatility. It has already found wide use in a great number of fields among which are plastics, textiles, rubber, paper, wire and adhesives.

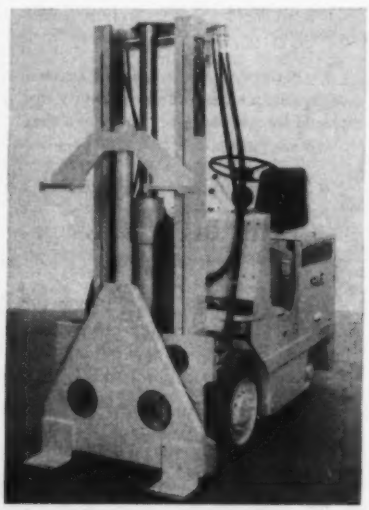
Outstanding among the features of the precision electronic testing instrument which contribute to its wide use is its wide full scale range extending from 2 grams to 5000 lb. In addition, a wide selection of jaw speeds is provided, ranging from 0.02 to 20 in. per minute. The combination of a system for changing the load sensitivity and push button switching for operating the moving crosshead make available fast routine measurements as well as more complex testing techniques fundamental to a research and development program.

Compression accessories also help to extend the versatility of this instrument. *Instron Engineering Corp., 2 Hancock St., Quincy 71, Mass.*



Reducer fitting

The Swagelok reducer fitting is designed to permit different sizes of tubing to be joined easily. It consists of a body, two ferrules and a nut. The two ferrules plus the threaded chuck inside the nut, clinch tight around the tubing wall and provide a leakproof seal. These reducer fittings, holding heavy or thin wall tubing equally well, are available in brass, aluminum, steel, stainless steel, and Monel with sizes ranging from $\frac{1}{8}$ in. to $\frac{7}{8}$ in. O.D. *Crawford Fitting Co., 884 East 140th St., Cleveland 10, Ohio.*



Lift truck clamp attachment

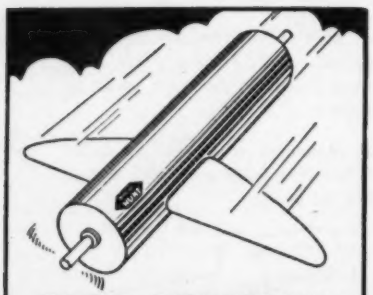
Two crated or boxed objects each with dimensions up to 75 in. high and 36 in. wide can be picked up and tiered simultantously as high as 17 feet with this hydraulically operated clamp attachment. When it was tested on a 3,000 pound capacity truck, two crates weighing up to 450 lb. each were handled. A hydraulic side shifter moving the clamp four inches to either side of center permits spotting so that space near walls can be used. Available for any capacity Yale gasoline powered or electric industrial truck. *Yale & Towne Mfg. Co., 11,000 Roosevelt Blvd., Philadelphia 15, Pa.*

Magnetic drives controller

Offering precise control of speed with no maintenance problems is the new E-M Regutron Magnetic Amplifier Control. This new controller is used with the E-M Adjustable-Speed Magnetic Drive and eliminates all the complicated electronic circuits of the previous electronic type amplifiers. All components in this new control are reliable, time-proven devices, and conservatively rated parts should last for years with little change in characteristics. They are built in ratings of 25 horsepower and higher in the usual motor speeds for loads such as fans, centrifugal pumps, and centrifugal compressors. *Electric Machinery Mfg. Co., Minneapolis 13, Minn.*

Protective surface coating

This protective coating, a compound of coal tar pitch called Tarlac, is said to retain all the protective and adhesive qualities of coal tar pitch and to be impervious to oils, greases, other petroleum derivatives, acids, alkalis, water and condensation. It is recommended for concrete structures, floors,



FAST DELIVERY ON "SHAF-TITE" ROLLS

FOR WET FELTS

plus patented features that give greater value.

Write for Catalog!

RODNEY HUNT MACHINE COMPANY

38 Maple Street, Orange, Mass., U.S.A.

REBUILT AND NEW

GUARANTEED MOTORS

M.G. SETS • GENERATORS

Hoists • Compressors • Transformers

Units of Every Size and Description

WE'LL SELL, BUY OR TRADE

CHICAGO Electric Co.

1318-24 W. CERMAK ROAD

CHICAGO 8, ILL.

MISCO

STAINLESS STEEL CASTINGS

FOR ALL EQUIPMENT EXPOSED TO CORROSION BY SULPHITE ACIDS OR OTHER CORROSIVE AGENTS

MICHIGAN STEEL CASTING CO.

DETROIT 7, MICHIGAN

MILL COGS

We make a specialty of "Ready Dressed" cogs which are READY TO RUN the moment driven and keyed. Write for circular "O" and instruction sheets free.

The N. P. BOWSHER Co., South Bend, Ind.

NEW

MASSIVE, HEAVY-DUTY ROGERS KNIFE GRINDER

★ 10.5 TONS
★ 210" CAPACITY
★ 30' BASE

Here is a new, 10-ton grinder designed for high production and fast grinding. This massive machine gives the most precision care possible to heavy duty doctor blades, paper and other straight knives up to 210" long (Series 220 is also available in many other capacities.) Variable speed (25-50 fpm), automatic operation and magnetic chuck applications speed up grinding cycle . . . . save you production dollars. Smooth table reversals, heavy-duty motors, cool operation and other Rogers features assure precision work. There's more savings and better work with the Series 220 . . . . Write today!

SAMUEL C. ROGERS & CO. 165 DUTTON AVE. BUFFALO 11, N.Y.

masonry, metals exposed to corrosive elements, mastic floors or other black top surfaces, wooden platforms and other wood exposed to the elements, and for other general protective purposes.

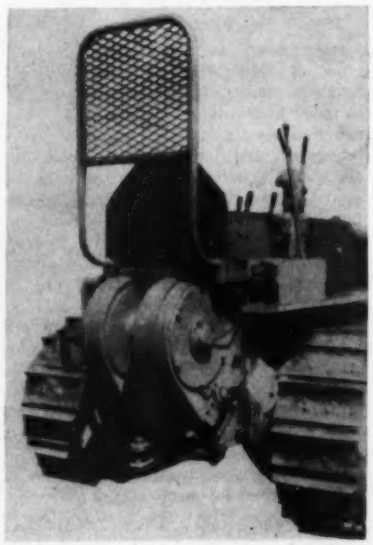
The coating, applied either by brushing or spraying, dries to a tough, enduring flat black film. It will not crack at low temperature or run at high temperature. *Flash-Stone Co., Inc., 30 E. Rittenhouse St., Philadelphia 44, Pa.*

Fork lift trucks

Five models have been added to the Towmotor line. Three of these, replacing models formerly produced, have solid or cushion tires and a shorter wheelbase for greater maneuverability. The two others feature pneumatic tires on all wheels to bring to three the number of Towmotor models so equipped. The new models have capacities ranging from 2,000 to 4,000 lb. and different size wheelbases. *Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.*

Load inverter attachment

The Baker load inverter attachment is adapted for any operation that requires the regular inverting of palletized loads. Idea of the attachment is to provide a method of inverting unit loads quickly without taking them from their pallets. This is accomplished by lifting the load out of its storage spot and revolving it 180 deg. by means of a plywood backstop and a side retaining board. When it has completed the turn, the inverted load shifts to an empty pallet and is put back in storage. The attachment can be quickly installed on any Baker 3000 or 4000 lb. capacity fork truck. *Baker Industrial Truck Div. of the Baker-Raulang Co., 1250 West 80th St., Cleveland 2, Ohio.*



Tractor winch

The Hyspeed winch with fast line speeds and quick positive brake action has many applications as a production tool, as well as for service, maintenance and general utility. A few of the jobs it will perform are lifting, pulling, crane work, light pile driving, ground skidding jobs, bundling pulp logs, skidding bundled pulpwood and for "feeder cat" work in logging. An important new application possible with it is the new method of forming and transporting bundles of pulpwood logs developed by Hyster. It can be mounted on either seat or fender tank type "Caterpillar" D4 tractors. *Hyster Co., 2902 N.E. Clackamas St., Portland 8, Oregon.*

Acrylic copolymer emulsions

Polyco 434 and Polyco 435 are new stable copolymer dispersions of higher acrylic esters. When dry, both these products or formulations yield flexible, water-clear, non-oxidizable films with moderate to considerable tack and excellent ageing characteristics. They contain no added plasticizers and thus are free of the disadvantages of embrittlement and variable film properties due to plasticizer migration or volatilization. Continuous films can be formed at room temperature. Film properties are enhanced by drying or heat treating at 60-80 C. *American Polymer Corp., Peabody, Mass.*

RECEIVER-TYPE PURIFIER—Low initial cost, no moving parts, a self-cleaning action, and careful fluid dynamics designing are some of the advantages of this Hi-eF purifier for removing destructive entrainment from vapor lines. *V. D. Anderson Co., 1935 West 96th Street, Cleveland 2, Ohio.*

The Paper Industry New Literature

Books

PREPARATION OF STOCK FOR PAPER MAKING. Vol. 2 of "Pulp and Paper Manufacture." Prepared by the Joint Textbook Committee of the Paper Industry of the U.S. and Canada. J. Newell Stephenson, Editor-in-Chief. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 18, N.Y. 587 pages. 9¼ x 6. $7.50.

The second in a series of four books on pulp and paper manufacture, this volume, although essentially new, is based on topics covered in Volume IV of an earlier series, "The Manufacture of Pulp and Paper." A description of newer equipment, methods, and procedures has been incorporated with much of the old material, making this new series completely up to date.

This volume is divided into seven chapters. Chapter one deals with the pulping of rag and other fiber. A new discussion of agricultural wastes such as flax and straw has been added to this revised edition. Chapter two, which is almost entirely new, "describes the equipment and explains the processes employed in the preparation, by deinking and otherwise, of wastepaper for use in making white papers and the preparation of wastepaper stock for boards and coarse papers." Chapter three, which is concerned with the beating and refining of *stuff* to be formed into paper, contains an added description of new equipment for these processes and new material on finishes for typical papers. Fillers and loading is the subject of chapter four, which has been thoroughly revised by a committee representing paper makers and filler producers. Chapter five concentrates on the sizing of paper. A new feature of this chapter is a special discussion of sizing for wet strength papers and the addition of standard testing methods for materials and paper qualities. The technical staff of a large dyestuff manufacturer has revised chapter six on paper coloring. The last chapter deals with semi-chemical, high-yield chemical and special groundwood pulping processes.

MICROBIAL DECOMPOSITION OF CELLULOSE. By Ralph G. H. Siu. Published by Reinhold Publishing Corp., 330 W. 42d St., New York, N. Y. 531 pages. 9¼ x 6¼. $10.00.

This volume, for all manufacturers and users of paper, wood products, cotton textiles, and related materials, was written by the research director, Pioneering Research Laboratories, U. S. Army Quartermaster Corps, Philadelphia.

This book contains data dealing with fungus and bacterial attack on cotton fabrics. Included is a clear, unified picture of the structure of cellulose, the biochemical mechanism of its decomposition, the physiology and manner of attack of the microorganisms concerned, and methods of preventing attack and protecting materials against deterioration. The work presents an understanding of the basic and applied work on the decay of cellulose products caused by bacteria. Included is heretofore unpublished governmental and military data.

THE SURFACE CHEMISTRY OF SOLIDS. By S. J. Gregg. Published by Reinhold Publishing Corp., 330 W. 42d St., New York, N. Y. 297 pages. 8¾ x 5½. $8.50.

The author, a lecturer in surface chemistry at University College of the South-West of England, Exeter, presents a systematic survey of the various branches of the surface chemistry of solids. The book deals with all those chemical and physicochemical phenomena which relate to the activity of the surface of a solid, or to the interface between a solid and a gas, a liquid or another solid.

Among the phenomena treated are the absorption of gases and vapors, the spreading of a liquid over a solid, catalysis and adhesion. The author summarizes and evaluates the theories of leading workers in these fields. Emphasis throughout is on general principles. Illustrated and indexed.

HANDBOOK OF DANGEROUS MATERIALS. By N. Irving Sax. Published by Reinhold Publishing Corp., 330 West 42nd St., New York 18, N.Y. 848 pages. 10¼ x 7¼. $15.00.

Concise safety facts and hazardous properties of 5,000 dangerous industrial materials, including trade-name products, are included in this new reference book. These materials are alphabetically arranged, cross-referenced, and indexed. The information about each material, which is concisely presented in non-technical language whenever possible, includes: maximum allowable concentration, toxicity, flammability, storage and handling, physical properties, formulas, and shipping regulations. Detailed information on symptoms, treatment and antidotes, first aid suggestions, personnel safety precautions, fire extinguishing agents, and other relevant data is presented whenever possible.

In addition to the discussion on the hazards of general chemicals and industrial materials, this handbook covers explosives, fungus diseases and fungicides, and radiation and radiation hazards. The section on radiation contains many useful charts and graphs.

The complete text of the Interstate Commerce Commission Shipping Regulations issued by the Bureau of Explosives is included, with detailed instructions on labelling, packaging, storage, shipping and all pertinent subjects.

FUEL OIL MANUAL. By Paul F. Schmidt. Published by the Industrial Press, 148 Lafayette St., New York 13, N. Y. 160 pages. 9 x 6¼. $3.50.

The author, chief chemist for Allied Oil Co., Inc., Cleveland, covers complete data on the properties of fuel oil, the possibilities and limitations of each grade of oil, methods which can be used to assure uniform quality and efficient combustion, instructions on how to diagnose fuel oil troubles and how to remedy them.

Technical language is used as little as possible, and theory and involved discussions of interest only to the chemist or refiner are avoided. All terms are fully explained. Twenty-two common fuel oil troubles are listed with their symptoms and the remedy to follow in each case. The text, which includes 34 tables, is divided into 24 chapters.

NORWAY—MACHINERY AND METAL PRODUCTS EXPORTS. Published by the Norwegian Export Council, Solplassen 1, Oslo, Norway. 76 pages. Paper bound. 11¼ x 8¼.

This booklet (printed in English), the fourth annual review in the "Norway" series, is a review of products manufactured by the Norwegian iron and metal-working industry, which are being exported or can be exported in the near future. These products are grouped according to the particular field with which they are concerned: fishing, logging and wood-processing, shipping, farming, etc. A special section has been set aside for consumer items which this industry can or intends to export.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Water Conditioning Equipment. Penfield Mfg. Co., Inc., 19 High School Ave., Meriden, Conn.—This new 4-page catalog explains the firm's method for planning water treating systems specifically for the standards and quantities required. Shown is equipment for boiler feed, process and other industrial needs.

Chain Drives. Whitney Chain & Mfg. Co., 237 Whitney St., Hartford 2, Conn.—Catalogue HD-51 is designed to assist in the selection of proper chain drive equipment. Included is the explanation of a simple and quick method of determining interchangeability of various makes of roller and conveyor chains. Various applications are described.

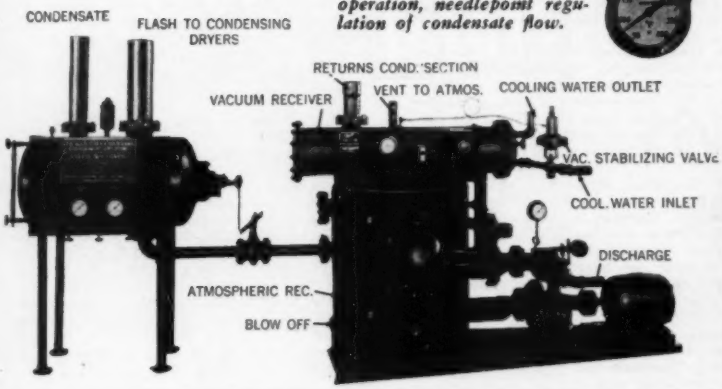
Fork Trucks. Baker-Raulang Co., Baker Industrial Truck Division, 1250 W. 80th St., Cleveland 2, Ohio—This 8-page specification bulletin (1326) includes user benefits of the major components of its line of type FC fork trucks, which are available in capacities of

Cut your steam costs with Improved Stickle Vacuum Differential Drainage!

Featuring the all-new Stickle Vacuum Pump

Applied to your driers, improved Stickle Vacuum Differential Drainage will rapidly remove air and condensation, boosting production efficiency . . . return condensate to your boiler room at maximum temperature, cutting your fuel costs 10-15%. Whether your machines operate at above- or below-atmospheric pressure, proper drainage is assured. Pressure changes require only simple resetting of pump controls. New Stickle Pump, with accent on accessibility, greatly simplifies inspection and maintenance. Has *exterior* float boxes; interchangeable vacuum chamber *above* tank, standard horizontal motor and pump. And built-in heat exchanger eliminates costly cooling equipment.

Stickle Micro Adjustable Orifice with Indicating Thermometer. Provides visual operation, needlepoint regulation of condensate flow.



For positive, uninterrupted circulation of steam—*at a positive saving*—specify *improved* Stickle Vacuum Differential Drainage. Send for *free* Stickle Bulletins 160 and 600.

STICKLE STEAM SPECIALTIES COMPANY
2215 Valley Avenue Indianapolis, Indiana

Hundreds of Experienced Mill Men Will Tell You DeZURIK *Easy-Operating* PLUG VALVES DON'T LEAK!

The DeZurik Rubber-Faced Plug stops leaks on virtually any flow. A style and type for all mill services. Write for catalog.

DeZURIK SHOWER CO. Sartell, Minn.

CLEAN PAPER

is impossible with old, worn Screen Plates. Change to new, fine-cut "Fitchburg" Screen Plates and be amazed at the instant improvement in QUALITY.

"FITCHBURG" *New Type—Duplex Slot*
FLAT PLATES
Rolled Bronze and Copper

Plain or Chromium Plated
BIRD SCREEN PLATES
JONES SCREEN PLATES

FITCHBURG
Screen Plate Co., Inc.
301 South Street
Fitchburg
Massachusetts

The Paper Industry

Professional and Business Services

ARTHUR C. DRESHFIELD, Ch.E.
CONSULTANT
Research . . . Development . . . Control
Market Research
Laboratory Investigations thru affiliation with
Chicago Testing Laboratory
536 Lake Shore Drive, Chicago 11, Illinois

Engineers
Industrial Plants • Textile & Paper Mills • Location Studies • Appraisals • Reports • Surveys
J. E. SIRRINE COMPANY
GREENVILLE
SOUTH CAROLINA

3,000, 4,000, and 6,000 lbs. Contained are dimension drawings, detailed specifications, and action pictures.

Electric Power. General Electric Co., Schenectady 5, N. Y.—Bulletin GEA-5600 (24 pages) deals with "packaged electric power" for industrial expansion. The publication outlines methods of obtaining electric power equipment for quick expansion at low cost and with a minimum of critical materials. Included are 52 photographs and diagrams.

Paper Machinery. Improved Paper Machinery Corp., Nashua, N. H.—This 4-page bulletin (J-100) features a cut-away drawing of an ideal pulp mill building, with pulp washing, high density storage, screening and deckering operations, together with a four-stage bleach plant. A flow sheet is also shown.

Flooring. Flash-Stone Co., Inc., Philadelphia 44, Pa.—"Why Engineer an Industrial Floor" is a 12-page bulletin pointing out why the installation of industrial floors for maximum life and minimum cost is a task requiring experienced planning, skilled technical execution, and exacting cost control. It describes how floors can be engineered to withstand moving and deadweight loads, shock and vibration, extremes of temperature, oils, greases, chemical and industrial wastes and other destructive agents.

Truck Maintenance. Baker-Raulang Co., Baker Industrial Truck Division, 1250 W. 80th St., Cleveland 2, Ohio.—"The Care and Maintenance of Industrial Trucks" is a 16-page bulletin published in the interest of more efficient, more continuous, and more economical service. Steps to be taken in preventive maintenance and annual check-ups are illustrated and described.

Strain Gauges. Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.—Four ways in which Baldwin weighing units are being used for industrial applications are described in a new 4-page bulletin. Applications include crane hooks, multi-tank weighing and batch control of liquids, continuous weight integrator for materials carried by belts, and an axle-scale for loaded highway trucks.

Electrical Measuring. Westinghouse Electric Corp., Pittsburgh 30, Pa.—Information on how to select electrical measuring instruments is contained in booklet B-4696. Included are an explanation of seven basic selection factors, types of instruments available in each classification, a check chart, and four typical selection problems. The booklet has 30 pages.

Steam Traps. Yarnall-Waring Co., Mermaid Lane, Philadelphia 18, Pa.—This 20-page bulletin (T-1750) is a supplement to a catalogue issued in July and contains a guide to proper selection of steam traps. It is designed particularly for engineers with many possible applications for the equipment.

Motor Starters. Arrow-Hart & Hegeman Electric Co., Industrial Control Division, 103 Hawthorn St., Hartford 6, Conn.—This 8-page folder illustrates and describes a new line of Arrow-Hart "Explo-Safe" and weatherproof motor starters for hazardous locations. Included are complete specifications, ratings, and wiring diagrams.

Vibrating Screens. Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.—Booklet 2377 (20 pages) illustrates and describes equipment for dry screening and for the separation of solids from liquids. Specific information on methods of selection, dimension tables, weights, horsepower requirements, and other data are included. A number of actual installations are shown.

Belt Conveyor Idlers. Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis.—Information on the latest designs and developments of Rex Belt conveyor idlers and machinery is contained in bulletin 51-81 (44 pages). Included are cross-section drawings, latest data on lubrication material and techniques, maintenance procedure, and descriptions of zipper bunker seals and belt conveyor trippers.

Mercury Switches. Micro Switch, Freeport, Ill.—Catalogue Hg-1 covers the five most popular designs of Honeywell mercury switches, with selection and application aids, and complete electrical ratings and data for the use of these switches in both a.c. and d.c. applications.

Power Systems. General Electric Co., Schenectady 5, N. Y.—A new 16-page bulletin (GEA-5521) describes power system equipment for pulp and paper mills. Illustrated with 26 photographs and diagrams, the publication features a discussion on types of turbine generators now available and advice on proper selection. It also outlines power generation and distribution equipment designed to meet specific mill needs, as well as the advantages of modern load-center systems and pre-assembled distribution equipment.

Induction Motors. Allis-Chalmers Mfg. Co., 931 S. 70th St., Milwaukee, Wis.—Construction features of large end-shield bearing squirrel-cage induction motors are given in 4-page bulletin 05B7542A. The motors are available in ratings and speeds up to 1750 hp at 1800 rpm. Special electrical modifications to suit application requirements are described.

Differential Converters. Minneapolis-Honeywell Regulator Co., Brown Instruments Division, Philadelphia 44, Pa.—Catalogue 2281 (12 pages) describes a few mercuryless flow meter, said to feature continuous range change adjustment from 0-20 to 0-200 inches of water. Operation principles of this pneumatic-balance type flow transmitter are covered, as well as specifications, applications and installation methods.

Air Pollution Detection. Leeds & Northrup Co., 4934 Stanton Ave., Philadelphia 44, Pa.—This 8-page folder, "Air Pollution by SO_2 Recorded by the Thomas Autometer," illustrates and describes the new application of the electronic Speedonax recorder to autometer equipment. Flow diagrams show operating sequence, in which SO_2 detection is based upon the principle of electrolytic conductivity. Complete specifications are included.

Chains and Sprockets. Morse Chain Co., 7601 Central Ave., Detroit 8, Mich.—Catalogue C 55-50 gives details on list prices, available sizes of Types A, B, and C Morse Stock sprockets, and information on Morse Stock roller chain from ⅜-inch to 2-inch pitch. Also included are data on drive selection, service factors, installation, and service.

Condensate Return Units. Roy E. Roth Co., 2484 Fourth Ave., Rock Island, Ill.—A selection table enabling rapid and accurate selection of the correct condensate return unit to fit specific needs is given in catalogue section 212 (6 pages). The new vertical design unit is described in detail, with specifications for pump, receiver, motor, and accessories.

Incinerators. Plibrico Jointless Firebrick Co., 1800 Kingsbury St., Chicago 14, Ill.—A new 16-page catalogue (file number 35-J-41) covers the Plibrico rubbish incinerator erected in four standard sizes rated at 500 to 3,500 lbs. per hr.; also Plibrico portable incinerators manufactured in four sizes from 135 to 450 lbs. per hr. In addition, descriptions are given of special incinerators for garbage and cafeteria refuse, biological and pathological material, wood refuse, and special applications.

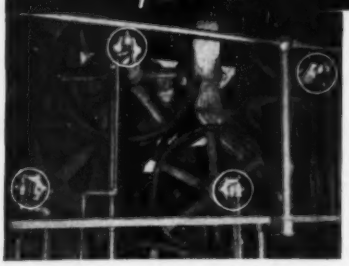
Mack
LOG and POLE TONGS
FOR HANDLING
LOGS ● POLES
Bridge Timbers ● Ties
Other Timber Products
All welded steel construction, combining rugged strength with light weight. Width permits operator to pick up long timbers. Shape permits easy access to corners of cars or trucks. Easy to handle.
MACK WELDING COMPANY
9212 GRAND AVE. PLACE ● DULUTH 8, MINNESOTA

The Trade-Mark of
Dependable Felts
TRADE MARK
The Waterbury Felt Company
SKANEATELES FALLS, N. Y.

COMPLETELY PACKLESS
SELF-LUBRICATING
SELF-ADJUSTING
SELF-ALIGNING

Only Johnson Joints offer *all* these cost-cutting, trouble-saving, production - boosting benefits. *Only* Johnson Joints end *all* the shortcomings of old style stuffing boxes, without compromise of any sort. No wonder so many hundreds of mills, and so many machinery manufacturers, have standardized on Johnson Joints. Why not find out how quickly Johnson Joints can pay their own way in your mill.

Johnson *Rotary Pressure* **Joints**



Write for catalog showing sizes and styles for all needs.

Installation in a midwestern mill — some of the 562 Johnson Joints purchased by this company.

JC

The JOHNSON CORPORATION, 845 Wood Street, Three Rivers, Michigan

WANTED—Personnel Supervisor for southern pulp and paper mill. Over a thousand employees. Must have required academic background and experience in testing, hiring and general personnel and labor relations. Will, also, have supervision of insurance and safety. Excellent climatic location and opportunity. In replying state complete history and salary required. Address: Box 527, The Paper Industry.

EMPLOYMENT SERVICE FOR PULP AND PAPER MILLS
We invite correspondence (confidential) with executives seeking positions and with employers seeking personnel.
CHARLES P. RAYMOND SERVICE, Inc.
Telephone Liberty 2-6547—294 Washington St., Boston 8, Mass.

NINE Publications for the Papermaker

Modern Pulp and Paper Making	$8.50
Drying of Paper on the Machine	1.50
Procedure Handbook of Arc Welding Design and Practice, 9th Edition	2.00
Outside U.S.A.	2.50
Notes and Observations on Beaters	1.00
Lessons in Papermaking—Part 1	1.00
Lessons in Papermaking—Part 2	1.00
Trouble on the Paper Machine	.75
Pulp Bleaching (A Symposium)	.50
Technology of Papermaking Fibres	.50

Mail your order with payment to:
The PAPER INDUSTRY
% Fritz Publications, Inc.
431 S. Dearborn Street, Chicago 5, Illinois

PRODUCTION PROBLEMS got you up a creek?

● The function of our Technical Sales Staff is to help solve various production problems in the field. These men are constantly working with new products and techniques—perhaps this experience would be helpful in smoothing out production sore spots in your operation.

Our basic, continuing research in starch chemistry is unsurpassed . . . under the direction of the foremost research men in this field.

Make the most of these facilities . . . no obligation of course.

For uniform quality products . . . for a dependable source of supply . . . depend on Corn Products Refining Company.

GLOBE
Starch for the beaters and for enzyme conversion;

AMIJEL
for the beaters;

CORAGUM
for corrugating; and

LAM-O-DEX
for laminating.

Write to
CORN PRODUCTS REFINING CO.
17 Battery Place • New York 4, N. Y.

Globe, Amijel, Coragum and Lam-o-dex are registered trade-marks of Corn Products Refining Company, New York, N. Y.

Bauer 8" Lab. Mill for grinding and fiberizing

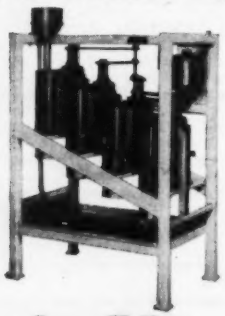
This mill is equipped with a 3-hp to 10-hp built-in motor or a V-sheave. It has a revolving disc and stationary disc. Built with the precision required for laboratory use, the mill has ample stamina for production service.

The model illustrated is especially adapted for reducing and fiberizing wet materials such as samples of semi-cooked chips. The front case is readily opened for recovery of the complete sample and for cleaning.

Many types of plates are available for specific reduction jobs. Adjustment of plates is made with calibrated hand-wheel, graduated for reproducible settings in increments of .001 inch.

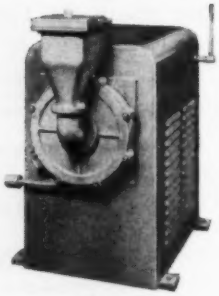
Extensively used in research, industrial, and university laboratories.

Other Bauer Laboratory Equipment



Bauer-McNett Classifier

Standard apparatus for fractionating samples of pulp or fluid paper stock to classify fiber lengths, providing basic data for the regulation of beating or refining operations.



Mead Laboratory Beater

Makes complete strength development curves on pulps in a matter of minutes. The charge consists of 80 grams o.d. pulp at 2% consistency. Gives reproducible results.

ASK FOR LITERATURE

THE BAUER BROS. CO.

1759 Sheridan Ave. • Springfield, Ohio

Established 1878

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.	
Roofing—		
No. 1	1.70 to	1.80
No. 2	1.25 to	1.30
No. 3 and 4	1.05 to	1.15
Twos and Blues—		
Repacked	5.25 to	5.50
Thirds and Blues—		
Repacked	4.50 to	4.75
Miscellaneous	4.00 to	4.25
Whites, No. 1—		
Repacked	8.00 to	8.50
Miscellaneous	6.50 to	7.00
White, No. 2—		
Repacked	5.50 to	6.00
Miscellaneous	5.00 to	5.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cotions	
Old Shepperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.	
Gunny No. 1—		
Foreign	6.50 to	6.75
Domestic	6.50 to	6.75
Wool Tares—		
Light	8.50 to	9.00
Heavy	9.00 to	9.50
No. 1 Scrap Bagging	5.50 to	6.00
Manila Rope—		
No. 1 large	10.00 to	10.25
No. 1 small	9.00 to	9.50
Sisal Rope—		
No. 1 large	8.50 to	9.00
No. 1 small	8.00 to	8.50
New Burlap Cuttings	8.00 to	8.50
Jute Threads—		
Foreign (Nom.)	8.00 to	8.50
Domestic	8.00 to	8.50
Strings—		
No. 1 sisal	5.50 to	5.75
No. 2 sisal	5.00 to	5.25
Soft jute	5.25 to	5.50
Mixed	3.75 to	4.00

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	175.00—
Hard White, No. 1	150.00—
Soft White, No. 1	110.00—
Soft White, one-cut	125.00—
Soft White, Misc.	90.00—
Fly Leaf, No. 1	45.00—
Fly Leaf, Woody No. 1	40.00—
No. 2 Mixed Col. Woody	35.00—
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	40.00—
Mixed Books	26.00—
Ledger Stock—	
No. 1 White	100.00—
No. 1 Mixed (Colored)	75.00—
Manilas—	
New Env. Cuttings	110.00—
New Env. Cuts, One-Cut	—
Extra Manilas	70.00—
Manila Tab Cards, Free of Ground Wood	110.00—
Colored Tab Cards	85.00—
Kraft—	
New Envelope Cuttings	110.00—
Tripled Sorted No. 1 100%	60.00—
No. 1 Old Assorted	35.00—
News—	
White Blank	80.00—
Overissue	18.00—
No. 1 Folded	14.00—
Old Corrugated Containers	17.00—
New Jute Corrugated Cuts	24.00—
Mill Wrappers	14.00—
Box Board Chips	10.00—
No. 1 Mixed Paper	10.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—		
Lump, cwt.	4.55—	
Ground, cwt.	4.30—	
Powdered, cwt.	4.70—	
Blanc Fixe—		
Pulp, bulk, ton	90.00—	
Dry, barrels	95.00—	
Bleaching Powder—		
Drums, cwt.	5.00 to	6.00
Casein (Domestic Standard)		
20-30 mesh (bags), lb.		
80-100 mesh (bags), lb.	37.00 to	38.00
Argentine, lb.	35.50 to	36.00
China Clay—		
Domestic Filler Bulk (mine) ton	10.00 to	15.00
Domestic Coating Bulk (mine) ton	15.00 to	25.00
Imported (ship side) Bulk (lump) ton	22.00 to	30.00
Chlorine—		
Tanks cars (wks) cwt.	2.70—	
Gelatine (silicin), lb.	1.25 to	1.35
Glyc. (C.P.) drums, lb.	54.25 to	54.75
Litharge, powd. bbl. lb.	20.00 to	21.00
Rosin (Gum)—	**New York, per 100 lbs.**	
E	9.60—	
F	9.60—	
G	9.60—	
WW	10.00—	
Rosin (Wood), carlots, F.O.B. South	6.00 to	6.25

MARKET QUOTATIONS

Salt Cake—
Dom. bulk (wks) ton..... 17.00 to 23.00
Imp. bulks on dock—
(Atl. ports) ton (Nom.) 25.00—

Soda Ash—
Bulk (works) cwt..... 1.20—
Paper bags, cwt..... 1.60—

Soda (Caustic)—
Solid drums, cwt..... 3.35 to 3.40
Ground and flake, drums, cwt. ..... 3.75 to 3.85

Sodium Silicate—
60 deg. 55 gal. drums, (works) cwt. ..... 1.80 to 1.90
40 deg. 35 gal. drums, (works), cwt. ..... 1.50 to 1.60

Starch—
Pearl, 140 lb. bags, cwt... 6.09—
Pearl, barrels, cwt..... 6.09—
Paper (Sp.) bags, cwt..... 6.09—
Powdered, barrels, cwt... 6.32—

Sulphur (Crude)
(Mine) bulk, long ton... 21.00 to 22.00

Talc—
Dom. 100 lb. bags (mine) ton ..... 25.00 to 28.00
Canadian ..... 35.00 to 45.00

Titanium Dioxide—
Barium Pig. bbls., lb..... .21 to .21½
Calcium Pig. bbls., lb..... .21 to .21½
Zinc Sulphide, bbls., lb.... 11.50 to 11.75

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite .....140.00—
Unbleached sulphite .....132.50—
Bleached sulphate .....145.00—
Semi-bleached sulphate .....140.00—
Unbleached sulphate 132.50
Bleached soda .....140.00—
Ground wood ..... 92.50—
Sulphite screenings ..... 72.50—
Sulphate screenings ..... 67.50—
Ground wood screenings..... 60.00—
Unbleached sulphate siderurus .....132.50—
Standard news print siderun ..... 92.50—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, follow:

Bleached sulphite .....225.00—
Bleached sulphate .....230.00—
Unbleached sulphite .....200.00—
Unbleached sulphate .....200.00—

PAPER

f.o.b. New York City

Boards— per ton
Binders .....140.00—
Chip .....105.00—
Chip, tube and can.....115.00—
Chip, full blending.....117.50—
Chip, sgl. mla. lined.....130.00—
Coated, white patent
.016 .....170.00 to 180.00
.020 and heavier.....160.00 to 170.00
Kraft liner .....115.00—
Filled News .....107.50 to 110.00
Container .....130.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)
Uncoated (Untrimmed)

Book, White (M. F.)—
A Grade E. F..... 18.15—
B Grade E. F..... 18.40—
A Grade S. C..... 18.65—
B Grade S. C..... 17.40—
No. 2 Uncoated Offset 4 sides, White..... —

Machine Coated White
No. 1 Glossy..... 23.90—
No. 2 Glossy..... 22.15—
No. 3 Glossy..... 21.90—
No. 4 Glossy..... —
No. 2 Offset..... 18.65—
C1S Litho (Varnish)..... —
C1S Litho (Non-Varnish) —

Rag Content Bond—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Extra 100% rag	57.50	58.50
100% rag	49.50	50.50
75% rag	38.00	39.00
50% rag	29.50	30.50
25% rag	24.00	25.00

Rag Content Ledger—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

Extra 100% rag	58.50
100% rag	50.50
85% rag	42.00
75% rag	39.50
50% rag	30.50
25% rag	25.00

Sulphite Bond—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Air dry bond (Watermarked)	20.00	21.00
No. 1 bond (M.F. watermarked)	15.50	16.20
No. 2 bond (M.F. watermarked)	14.90	15.60
Plain bond (M.F. unwatermarked)	14.00	14.60

Sulphite Ledger—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

No. 1. M.F. watermarked	16.50
No. 2. M.F. watermarked	15.90
Plain. M.F. unwatermarked	15.00

Glassine (f.o.b. mill)—
OPS base ceilings (CPR 76): per cwt.
25 lb. base No. 1 bleached glassine ..... 22.50—
25 lb. base No. 1 bleached greaseproof ..... 20.00—

News— per ton
Rolls, Standard (Contract) .....114.00 to 116.00
Rolls (Spot)..... (Nominal)
Sheets .....130.00—

Tissues (Carlots)— per ream
White No. 1..... 2.25—
White No. 2..... 1.75—
Bleached Anti-Tarnish..... —
Colored ..... 2.20—
Anti-Tarnish Kraft ..... 2.10—
Manila ..... 2.20—
Napkins, semi-crepe (12½ lb. to M shts.) per cs. ..... .90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs..... .90—
Toilet, Bleached (M shts.) per cs..... 9.85—
Toilet, Unbleached (M shts.) per cs..... 6.60—

Towels per case
Bleached ..... 6.85—
Unbleached ..... 5.65—

Wrappings (Kraft)—
OPS ceilings, per cwt., 50 lb. base weight: per cwt.
Standard wrapping ..... 7.75—
Butchers, counter rolls..... 8.25—
Standard bag, mill rolls..... 7.50—
Shipping sack, mill rolls..... 7.75—
Gumming, mill rolls..... 8.00—
Asphalting, mill rolls..... 7.75—
Envelope, mill rolls..... 9.25—

Wrappings (Sulphite and Bleached Kraft)—
(Rolls, f.o.b. mill)

Bleached Papers— per cwt.
M.F. & M.G. Waxing, 20 lb. (carloads only) —
(10,000 lb.) —
Drug wrapp., 35 lb.. —

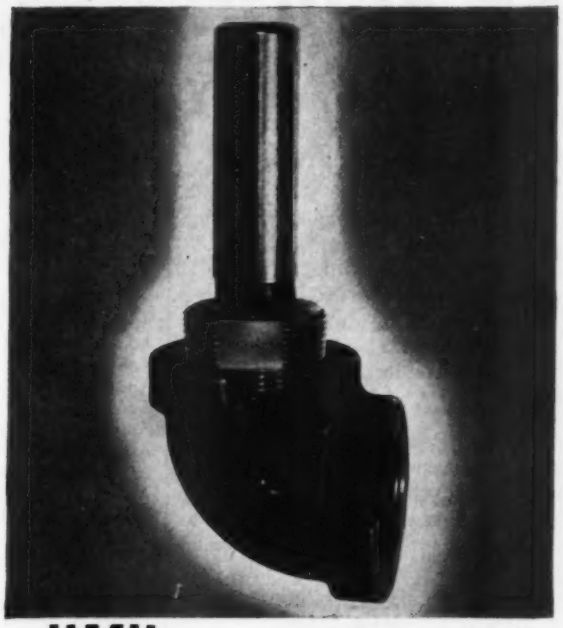
Unbleached Papers
Com. Gr. Butch. 40 lb. —
No. 1 Butchers..... —
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb..... —
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb..... —
Steam Finish, 50 lb... —
Water Finish, 50 lb... —

Manilas—
Envp. Mla., Sub. 16-40 (No. 1)..... —
Env. Mla., Sub. 16-28 (No. 2)..... —
Envp. Mla. (Prices based on large sheets untrimmed ream marked, in bdls.)..... —

Wrapp. Mla. 35 lb. up—
No. 1..... 8.75 to 10.25
No. 2..... —

M.G. Sulphite and Kraft (other than Waxing)
Grade B-20 lb..... —
Grade A-22 lb..... —

Sixth of a Series



"K" on a fitting means conformity to standards

In respect to metallurgical formula, uniformity of wall thickness, and pressure capacity, "K" Fittings meet the specifications of American Standards on Weights and Measurements with plenty to spare.

Tapping is done according to American Briggs standards for pipe threads. The threads on "K" Fittings are true, full, clean, and perfect.

In chemical and physical properties, "K" Fittings far exceed the specifications of the American Society for Testing Materials.

The Underwriters' Laboratories and Associated Factory Mutual Companies approve the complete "K" line of standard and extra heavy screwed fittings, fittings for sprinkler work, and extra heavy flanged fittings and flanges.

You are on the safe side with a wide margin when you use "K" Fittings. Specify "K's" when ordering from your supplier.

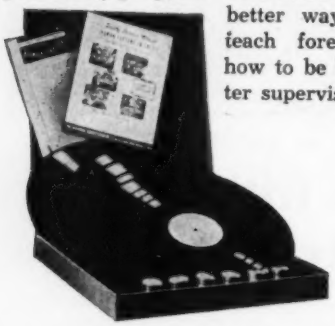
THE KUHNS BROTHERS COMPANY
1818 McCall Street
Dayton 1, Ohio
Established 1887

CAST-IRON FITTINGS
3,000 Shapes and Sizes

PUT *ACTION* IN YOUR SAFETY PROGRAM

Add a touch of showmanship to your safety program. Films let you tell your training story with the dramatic impact of pictures . . . action . . . sound. You can cut your safety training in half, give fewer refresher courses and get better results by using training films.

Here are three film sets that will help you arouse and keep alive interest in your safety program. And there is no better way to teach foremen how to be better supervisors.



SPEAKING OF SAFETY

A brand new set of films that will teach your foremen and supervisors the tips they should know about making safety talks, and how to transmit management's ideas and plans. Six 35mm sound slidefilms and leader's manual in an attractive leatherette case.

HUMAN FACTORS IN SAFETY

This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

Write for complete information and details to the

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois

The Paper Industry Index to Advertisers

When writing them, please mention The PAPER INDUSTRY.

Refer to the Paper and Pulp Mill Catalogue and Engineering Handbook at your mill office, for complete listing of all advertisers' products.

Advertising Council, Inc. 1078
American Car & Foundry Co. .....
American Defibrator, Inc. .....
American Hoist and Derrick Co. 995
American Optical Company. .....
Anheuser-Busch, Inc. 1002
Anthracite Equipment Corporation. ....
Appleton Machine Co., The. .....
Appleton Wire Works, Inc. .....
Appleton Woolen Mills. 1033
Armstrong Machine Works. 992
Arnold, Hoffman & Co., Inc. 1086
Asten-Hill Mfg. Co. .....
Atkins and Company, E. C. 1094
Aurora Pump Company. .....

Babcock & Wilcox Tube Co. 997
Bagley & Sewell Co., The. 1042
Bailey Meter Company. .....
Barco Manufacturing Co. .....
Bauer Bros. Co., The. 1106
Becco Sales Corporation. 1013
Beckman Instruments, Inc. 1018
Beloit Iron Works. 1045
Bird Machine Company. 1014
Birmingham Tank Company. 1087
Black-Clawson Co., The. 1012
Bowsher Co., The N. P. 1100
Broadway Rubber Corp. .....
Buffalo Forge Company. .....
Buffalo Pumps, Incorporated. .....
Bulkley, Dunton Pulp Co., Inc. .....

Cameron Machine Co. 1030
Carthage Machine Co. .....
Chain Belt Company. .....
Chicago Bridge & Iron Company. 1019
Chicago Electric Company. 1100
Classified Advertising. 1105
Cochrane Corporation. 1001
Corn Products Sales Co. 1105
Curlator Corporation. 1083

DeZurik Shower Company. 1103
Diamond Power Specialty Corp. 999
Dietert Co., Harry W. .....
Dilts Machine Works. 1012
Downingtown Mfg. Co. ..... 2nd Cover
Draper Brothers Company. .....
du Pont de Nemours & Co., E. I. .....

Eastwood-Nealley Corporation. 1098
Electric Eye Equipment Co. 1037
Electric Machinery Mfg. Co. .....
English China Clays Sales Corp. 1095
Eriez Manufacturing Co. .....

Fabri-Valve Co. of America. 1091
Farquhar Company, A. B. .....
Fawick Airflex Company, Inc. .....
Fisher Governor Co. .....
Fitchburg Screen Plate Co., Inc. 1103
Foxboro Company, The. 1041
Fritz Publications, Inc. 1105, 1109
Fulton Iron Works Company. 1007

Garlock Packing Co., The. .....
General American Transportation Corp. 1110
General Chemical Division, Allied Chemical & Dye Corporation. .....
Gilbert & Nash Company. .....
Goulds Pumps, Inc. 1079
Graton & Knight Co. 1082
Graver Water Conditioning Co. 996
Griffiths & Sons, Inc., James. .....
Gruendler Crusher & Pulverizer Co. ...

Hanchett Manufacturing Co. 1097
Harrington & King Perforating Co. .....
Hercules Powder Company. .....
Hooper & Sons Co., Wm. E. .....
Hubinger Company, The. .....
Hudson-Sharp Machine Company. 1096
Hunt Machine Co., Rodney. 1100
Huyck & Sons, F. C. .....

Improved Paper Machy. Corp. .....
Infilco Incorporated. .....
Ingalls Iron Works Co. 1087
Insul-Mastic Corporation of America. 1011
International Harvester Co. .....

Jackson & Church Company. .....
Jeffrey Mfg. Co., The. .....
Jenkins Bros. 1009
Jenssen Company, Inc., G. D. 1095
Johnson Corporation, The. 1105
Jones & Sons Company, E. D. 1095
Jones Foundry & Machine Co., W. A. 1090

Kalamazoo Tank & Silo Co. .....
Kelco Company. 998
Kuhns Brothers Company, The. 1107

Langston Co., Samuel M. .....
Layne & Bowler, Inc. 1093
Leeds & Northrup Company. .....
Lindsay Wire Weaving Co., The. 1091
Link-Belt Company. 989, 1077
Lockport Felt Company. .....
Lodding Engineering Corp. .....
Lunkenheimer Co., The. ..... 4th Cover

Mack Welding Company. 1104
Magnus Metal Corporation. 1085
Mathieson Chemical Corporation. .....
Michigan Steel Casting Co. 1100
Midwest-Fulton Machine Co., The. 1093
Midwest Piping & Supply Co., Inc. .....
Milton Roy Company. .....
Mine Safety Appliances Co. .....
Modern Engraving & Machine Co. .....
Morden Machines Company. .....
Morningstar, Nicol, Inc. .....
Mt. Vernon-Woodberry Mills, Inc. 1022
Murray Mfg. Co., D. J. .....

Nash Engineering Co., The. 1075
National Aluminate Corp. 990
National Conveyor & Supply Co. .....
National Distillers Chemical Corp. .....
National Safety Council. 1108

(Continued on facing page)

Naylor Pipe Company....1088
Noble & Wood Machine Co....3rd Cover
Norton Company....

Ohio Injector Co., The....
Oldbury Electro-Chemical Co....
Oliver United Filters, Inc....1072
Orr Felt & Blanket Co., The....
Owen Bucket Company, The....1093

Paisley Products, Inc....
Palmer Filter Equipment Company....
Paper & Industrial Appliances Inc....
Paper and Pulp Mill Catalogue....1109
Paper Industry, The....1105
Pennsylvania Flexible Metallic Tubing Co. ....
Perfecting Service Co....1st Cover
Perkins & Son, Inc., B. F....1071
Permutit Company, The....
Photovolt Corporation....1097
Pittsburgh Piping & Equipment Co....1084
Poole Foundry & Machine Co....1097
Powell Company, The Wm....1021
Pusey & Jones Corp., The....1027

Raymond Service, Inc., Chas. P....1105
Read Standard Corporation....1099
Rice Barton Corporation....1003
Rice Barton Research Corp....
Rogers & Co., Samuel C....1101
Rohm & Haas Company, Resinous Products Division ....
Roots-Connersville Blower Corp....1092
Ross Engineering Corp., J. O....
Ross Heater & Mfg., Inc....
R-S Products Corporation....1028

Sandusky Foundry & Machine Co....
Sandy Hill Iron & Brass Works, The..1080
Sarco Company, Inc....1016
Shartle Bros. Machine Co....1012
Shuler & Benninghofen....1000
Solvay Sales Division, Allied Chemical & Dye Corporation....
Standard Oil Co. (Indiana)....1008
Stein, Hall & Company, Inc....1091
Stickle Steam Specialties Co....1103
Sutherland, Inc....
Sutherland Refiner Corp.... 993

Takahashi & Co., C. T....
Testing Machines, Inc....
Timken Roller Bearing Co....1005
Titanium Pigment Corporation....
Toledo Scale Company....1020
Tracerlab Inc....
Tri-Clover Machine Co....
Tropical Paint & Oil Co....
Turney Halsey Company....1022

U.S.A.—Treasury Dept....

Valley Iron Works Company....1038
Vanderbilt Co., Inc., R. T....

Warren Steam Pump Co., Inc....1010
Waterbury & Sons Co., H....1095
Waterbury Felt Co., The....1104
Western Precipitation Corp....
Weyerhaeuser Timber Co.... 994
Whitney Chain Company....1089
Williams-Gray Company....
Worthington Pump & Machy. Corp...1004
Wyandotte Chemicals Corporation....1006

Yarnall-Waring Company....

Professional & Business Services Section
Dreshfield, Arthur C....1104
Sirrine Company, J. E....1104

Looking for Something?

★ **machinery?** ★ **equipment?**

★ **chemicals?** ★ **information?**

3 books in One!

1 THE BUYERS SERVICE SECTION . . . includes a complete, cross-indexed list of 150 of America's largest and most responsible manufacturers and Suppliers, and an exhaustive description of their products as they apply to the paper and pulp industry . . .

2 THE MANUFACTURERS CATALOGUE SECTION . . . contains pages, inserts and complete catalogues giving exact data on equipment available to the paper and pulp industry . . .

3 THE ENGINEERING HANDBOOK . . . is a comprehensive source of the vital facts of the industry, and quick information for the paper and pulp industry's executives and personnel—119 pages of engineering data, graphs, charts, tables, etc., etc.

IT'S IN YOUR MILL OFFICE—NOW!

Refer to it whenever you are "looking for something." Make it available to EVERYBODY in your plant. Cooperate: write us your comments and suggestions for improving the new 1952-53 edition now in preparation.

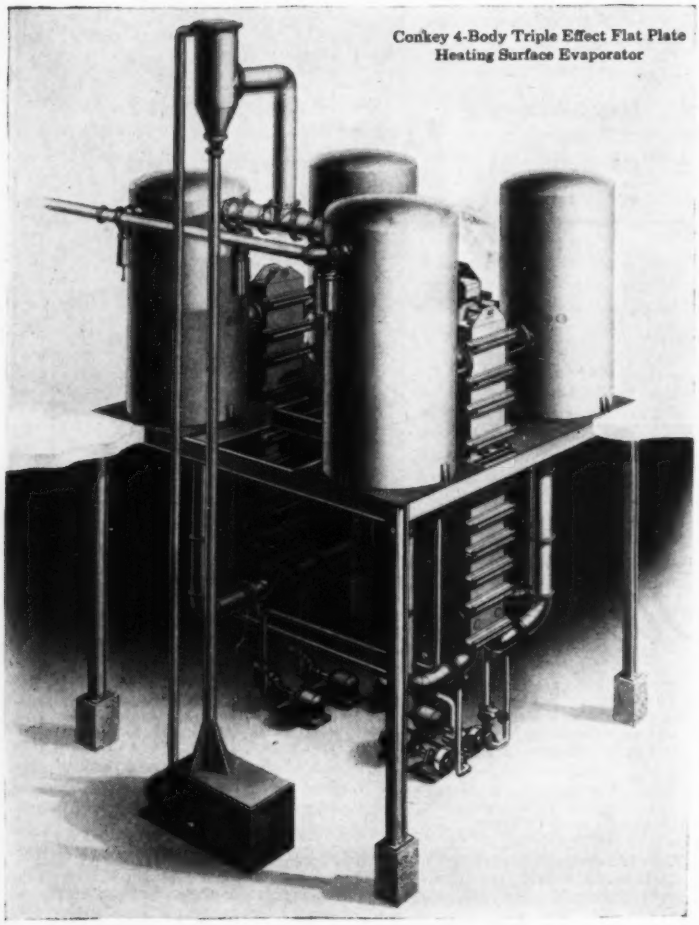
"The Paper and Pulp Mill Catalogue" and "The Paper Industry" are published by

FRITZ PUBLICATIONS, INC.

431 SOUTH DEARBORN STREET . . . CHICAGO 5

Since 1919 — the Service Organization of the Paper and Pulp Industry

NO shut down time! stream pollution! scale removal costs!



Conkey 4-Body Triple Effect Flat Plate Heating Surface Evaporator

Conkey Flat Plate Heating Surface Evaporator *with Rosenblad Switching System**

The proven system for avoiding stream pollution by sulphite pulp mill waste liquors that proved so outstandingly successful in commercial installations all over Scandinavia, is now adapted for use in this country by General American. *In every instance* where a Rosenblad Switching System has been installed, shut down time *and* scale removal *costs have been practically eliminated!* The Rosenblad System utilizes the condensate wash as a descaling operation carried on during full capacity operation of the evaporator. Surfaces subjected to boiling liquor are periodically switched with those in contact with vapor and condensate to clean heating surfaces during normal continuous operation. *Every part* of the equipment is switched, consequently scale is washed away from pipe lines, valves and vessels . . . in addition to heating surfaces.

At present in this country . . . Rosenblad Switching Systems in Conkey Flat Plate Heating Surface Evaporators are being constructed for full scale commercial operations. *Write today for detailed bulletin.*

*Patents Applied For

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION

PROCESS EQUIPMENT DIVISION

Sales Offices: 10 East 49th Street, New York 17, New York
General Offices: 135 South La Salle Street, Chicago 90, Illinois

Sole Licensee in the U. S. A. for the A. B. Rosenblads Patenter Evaporator Switching System

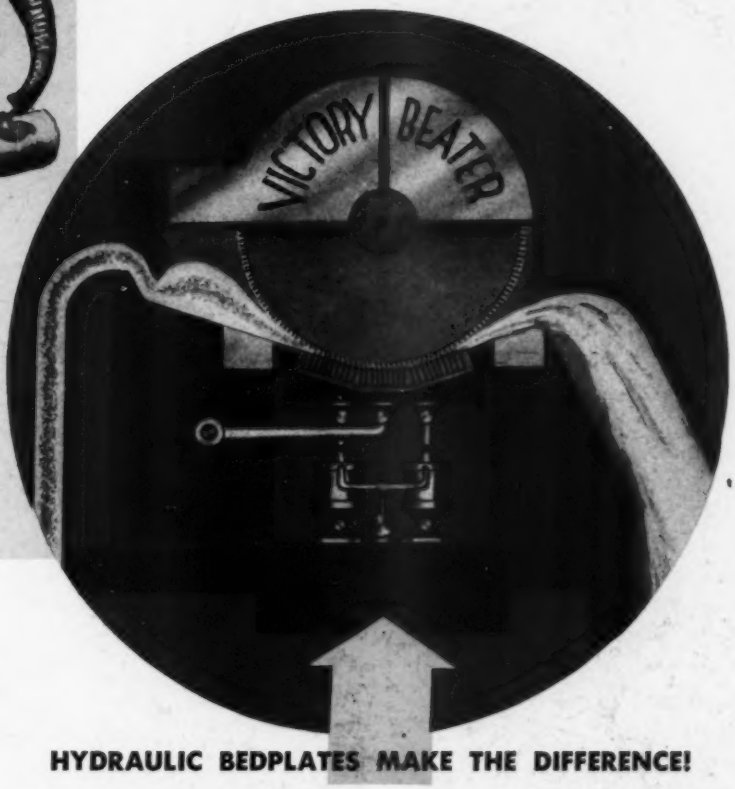
OFFICES IN PRINCIPAL CITIES

Other General American Equipment:
Turbo-Mixers, Filters, Dewaterers, Dryers, Towers, Tanks, Bins, Pressure Vessels

EXCLUSIVE FEATURES OF THE VICTORY BEATER

WEIGHT 10 TONS

PRESSURE UP TO 40!



1. *Controlled Flow — uniform, positive fibrillation*
2. *Pressurized bedplates*
3. *Absolute control up to 40 tons bedplate pressures*
4. *Centralized bedplates assure 100% roll-bedplate contact*
5. *Highest effective inch cut potential*
6. *Horizontal roll oscillation makes bars self-honing*
7. *Lowest maintenance cost*
8. *Tailored-to-your-plant, low-cost installation*
9. *Spherical, anti-friction roller bearings*
10. *1000 gallons per minute capacity*
11. *Highest quality, high tonnage production*
12. *All-time record for continuous production!*

HYDRAULIC BEDPLATES MAKE THE DIFFERENCE!

In the *Controlled Flow* VICTORY BEATER* hydraulic bedplates accurately control squeeze pressures up to 40 tons . . . *more than 4 times the actual weight of the roll!* The roll is stationary and the zero-to-forty ton squeeze is adaptable to any fibre condition. Centralized bedplates assure 100% roll-bedplate contact at all times. Think what this means in terms of continued uniform fibre treatment and quality high tonnage production!

VICTORY BEATERS are made in two styles: (a) ***Single Roll*** *units for handling batches as small as 500 pounds. (b)* ***Multi-Roll*** *units with two, three or more rolls for treating 100, 150, 200 or more tons per day on a continuous production basis.*

*Patents issued and pending.

The *Controlled Flow* VICTORY BEATER is in a class by itself — a rating earned by superior on-the-job performance. All the facts and figures are available for your examination, so write, wire or phone today for complete information. Ask for Booklet PI1251.

THE NOBLE & WOOD MACHINE CO.

Paper Mill Machinery

HOOSICK FALLS • NEW YORK • U.S.A.

Mid-West: Ronningen Engineering Sales • Vicksburg, Mich. West Coast: Dan E. Charles Agency • 706 Jones Bldg. • Seattle 1, Wash.

Have you discovered the "Hidden Values" of LUNKENHEIMER engineering devices?

LUNKENHEIMER
BOTTLE OILER
FIGURE 1815

★

STRETCH PLANT CAPACITY

★

CUT MAN-HOURS OF MAINTENANCE

★

REDUCE SAFETY HAZARDS

Your goal is fast, quality production. You install the best machinery and hire crack technicians. *Protect that investment* . . . keep your machinery humming at peak efficiency — with Lunkenheimer engineering devices.

Install Lunkenheimer Bottle Oilers at bearing points that are hard to reach and often neglected. Bottle Oilers *require less upkeep* and *cut accidents 'way down* on loom and card bearings in textile mills . . . on roller and fan shaft bearings of paper-making machines . . . in *every* plant where machinery moves. Pumps and all types of lubricators reduce costly maintenance shutdowns and eliminate the dangerous practice of hand-oiling moving machinery.

Don't overlook Lunkenheimer's *complete* line of engineering devices — pop-safety and blow-off valves, water gauges and gauge cocks, fusible plugs, lubricators for compressor and pump cylinders, and oil and grease cups. Get together with your Lunkenheimer distributor. He'll be glad to show how Lunkenheimer engineering devices will boost your output, cut accidents, and protect your overworked—and irreplaceable—machinery.

Write today for Circular 580 — the new bulletin describing Lunkenheimer Bottle Oilers, Oil Cups, and Constant Level Oil Controls. Address: The Lunkenheimer Co., Box 360S, Cincinnati 14, Ohio.

BRONZE • IRON • STEEL

LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

L-451-1